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A Statistical Study of Diphtheria
Frederick S. Crum, Ph. D.

U. S. Army Methods of Refuse Disposal
Major James A. Phalen

The Examination of Recruits for the Army
Major H. D. Orr

Defects Found in Recruits for the U. S. Navy
Assistant Surgeon C. A. Costello

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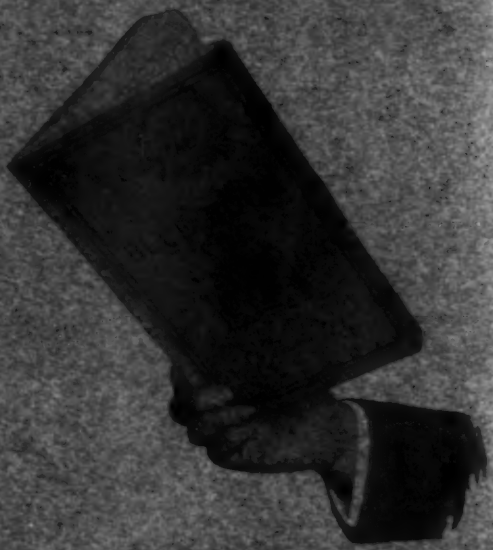

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A STATISTICAL STUDY OF DIPHTHERIA.

FREDERICK S. CRUM, PH. D.,
Assistant Statistician, Prudential Insurance Company of America, Newark, N. J.

Read before the Vital Statistics Section; American Public Health Association, Cincinnati, Ohio, October 27, 1916.

STATISTICS of diphtheria and croup are difficult to appraise for various reasons. This disease was for many years confounded with various other diseases, including scarlet fever, and its positive diagnosis in all cases was not possible until Klebs discovered the specific germ in 1883. Then, again, various terms were used more or less interchangeably for diphtheria for a long period previous to 1821 when the term *diphtheria* was first used by Bretonneau. Subsequent to 1821 croup, even of the membranous type, was separately reported in most of the registration offices of the world and this was continued until comparatively recent years.

Diphtheria as a cause of death was first so separately classified by the Registrar-General of England in 1855; it appeared for the first time in the New York City reports in 1857; and in the Massachusetts registration reports in 1858. In the Annual Report of the City Inspector of New York for the year ending December 31, 1860, the statement was made that "It (diphtheria) is not contagious. No reliable evidence has otherwise been given." (p. 244.) In this report the further statement was made that "It serves well as a cloak when the patient died of *croup* or *scarlet fever*, for our *panic-makers* have made the idea general that it is almost positively fatal, in most cases; hence, a death from it is regarded as a forecast result, and no fault is found with the attending physician."

Many experiments with the Klebs-Loeffler bacillus during the period 1883 to 1890, led to the discovery of antitoxin in the latter year, and this discovery led immediately to many controversies over the question of the merits of antitoxin as a curative agent. The use of antitoxin, however, was begun at once, notably in Germany and in New York City, and doubt as to its efficacy was quickly dispelled when the curative results began to be reflected in the decreased mortality among cases treated with the new remedy.

Because of the recent improvements in laboratory practice and the rapid extension of the application of scientific methods to the diagnosis of diphtheria it is quite impossible to compare the diphtheria morbidity rates of recent years with the morbidity rates of the pre-antitoxin or early antitoxin periods. In the comparative death-rates of this disease, however, we are on safer ground, for the cases of diphtheria and membranous croup which terminate fatally are more likely to be correctly certified than mild cases are likely to be correctly diagnosed.

In the years immediately subsequent to the discovery of antitoxin there was a lively controversy waged between those favoring and those opposed to its use. Today there are few physicians who would be bold enough openly to proclaim their opposition to the use of antitoxin, for such an expression of opinion would be a bad advertisement in any enlightened community. All diphtheria mortality statistics clearly indicate a decline in the mortality from this disease immediately after the use of antitoxin has become extensive in any given locality, city or country.

In Table 1 the comparative mortality from diphtheria and croup in pre-antitoxin and recent antitoxin periods is exhibited for twenty countries, in most of which the registration of vital statistics has presumably been fairly efficient throughout the periods to which the data relate.*

According to this table the average annual death-rate in the twenty countries combined was 16.3 per 100,000 of population during the antitoxin period,

*See also Chart I, p. 447.

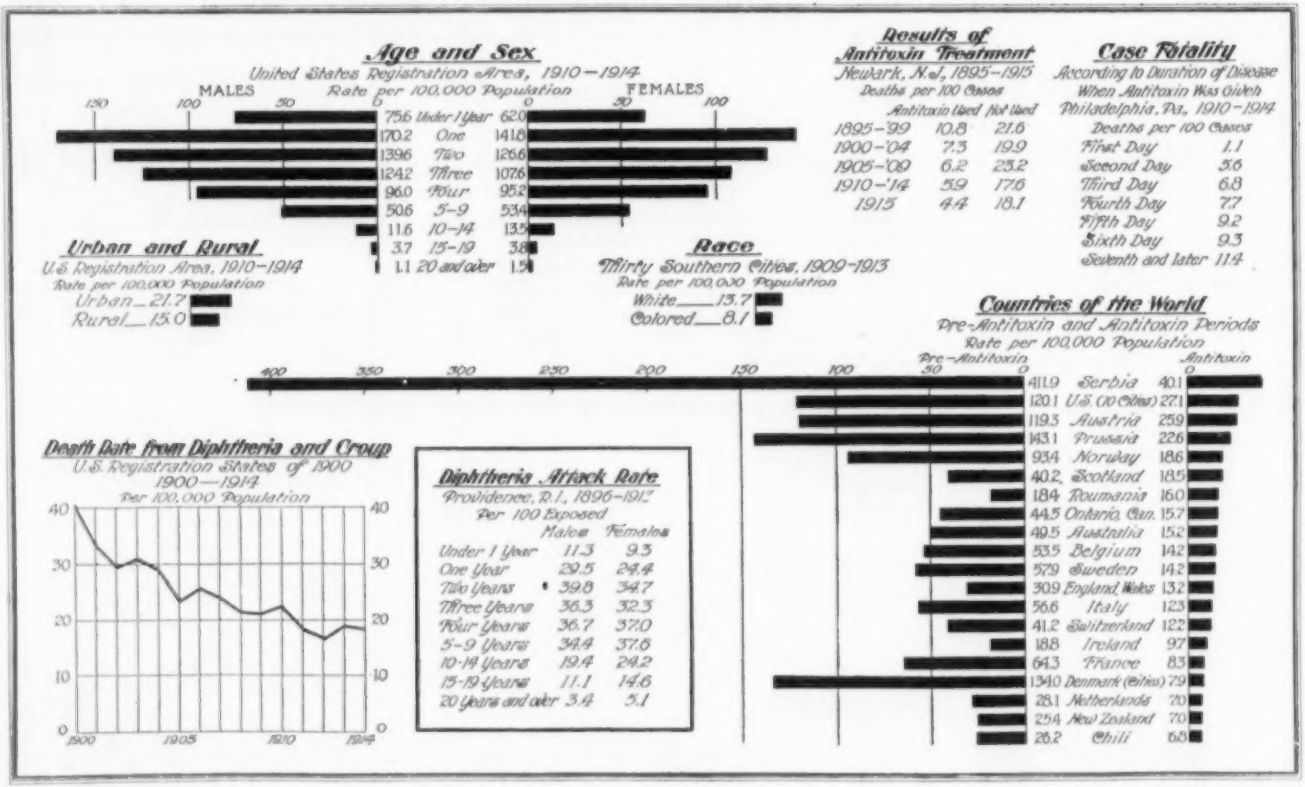
TABLE 1. MORTALITY FROM DIPHTHERIA AND CROUP IN TWENTY COUNTRIES.

Country.	Pre-Antitoxin Period.				Antitoxin Period.				Mortality Reduction.	
	Years.	Population.	Deaths.	Rate per 100,000 population.	Years.	Population.	Deaths.	Rate per 100,000 population.	Decrease in the rate.	Estimate of lives saved yearly.
Serbia	1892-96	11,383,189	46,891	411.9	1907-11	14,319,158	5,747	40.1	371.8	10,648
Ten cities of the United States	1889-93	34,048,719	40,877	120.1	1910-14	62,137,543	16,839	27.1	93.0	11,558
Austria	1889-93	119,900,414	143,090	119.3	1908-12	142,091,028	36,839	25.9	93.4	26,543
Prussia	1889-93	150,981,087	216,073	143.1	1909-13	202,402,338	45,723	22.6	120.5	48,779
Norway	1889-93	9,979,100	9,222	93.4	1909-13	11,872,500	2,210	18.6	74.8	1,776
Scotland	1889-93	20,213,621	8,120	40.2	1910-14	23,706,119	4,389	18.5	21.7	1,029
Roumania	1889-93	20,877,394	4,952	18.4	1910-14	36,340,027	5,799	16.0	2.4	174
Ontario	1889-93	10,747,138	4,778	44.5	1910-14	12,772,835	2,011	15.7	28.8	736
Australia	1889-93	15,932,362	7,889	49.5	1910-14	23,228,258	3,529	15.2	34.3	1,593
Belgium	1889-93	30,757,190	16,470	53.5	1908-12	37,323,929	5,307	14.2	39.3	2,934
Sweden	1889-93	23,955,210	13,860	57.9	1907-11	27,255,585	3,857	14.2	43.7	2,382
England and Wales	1889-93	145,479,965	44,933	30.9	1910-14	181,930,953	24,097	13.2	17.7	6,440
Italy	1889-93	152,276,502	86,138	56.6	1909-13	173,569,932	21,415	12.3	44.3	15,378
Switzerland	1889-93	14,897,082	6,131	41.2	1909-13	18,915,843	2,301	12.2	29.0	1,097
Ireland	1892-96	22,932,527	4,314	18.8	1910-14	21,914,149	2,117	9.7	9.1	399
France	1889-93	50,451,824	32,460*	64.3	1907-11	197,206,000	16,379	8.3	56.0	22,087
Denmark†	1890-94	3,843,185	5,151	134.0	1910-14	5,690,580	447	7.9	126.1	1,435
The Netherlands	1892-96	23,832,786	6,705	28.1	1910-14	30,394,016	2,115	7.0	21.1	1,283
New Zealand	1892-96	3,382,053	860	25.4	1910-14	5,205,686	362	7.0	18.4	192
Chili	1889-93	13,191,076	3,458	26.2	1910-14	17,526,572	1,198	6.8	19.4	680
Total		885,062,424	702,472	79.4		1,245,803,051	202,581	16.3	63.1	157,143

† Cities only.

CHART I.

Mortality from Diphtheria and Croup



against an average rate of 79.4 during the pre-antitoxin period. This means that within a period of twenty-five years the mortality rate of diphtheria and croup in these combined countries has decreased 63.1 per 100,000 population, or 79.6 per cent. In these twenty countries combined the present annual saving of lives through the use of antitoxin and other improved methods of diphtheria diagnosis and treatment is more than 157,000 per year. On this basis, it is conservatively estimated that not fewer than 250,000 lives are at present (1916) annually saved from the ravages of diphtheria and croup in the various countries of the world where antitoxin is more or less extensively used as a curative agent.

In the United States the positive evidence of the value of antitoxin is so abundant that it is difficult to select the best illustrative examples. Table 2, however, which shows the comparative mortality in twelve representative American cities for pre-antitoxin and antitoxin periods should suffice to convince any skeptics who may yet survive.* In these twelve cities combined the average annual mortality rate of diphtheria and croup has declined from 121.9 per 100,000 of population during 1885 to 1894 to 28.0 during 1905 to 1914—an actual decrease in the death-rate of 93.9, or 76.9 per cent. This means that in these twelve cities only the present annual saving of lives from a terrible form of death is approximately 10,000.

The decline in the mortality from

*See also Chart II, p. 449.

TABLE 2. COMPARISON OF THE MORTALITY FROM DIPHTHERIA AND CROUP IN TWELVE AMERICAN CITIES. PRE-ANTITOXIN AND ANTITOXIN PERIODS.

Cities.	Pre-Antitoxin Period	Antitoxin Period	Reduction in Mortality.	
	1885–1894.	1905–1914.	Antitoxin Period as against Pre-Antitoxin Period.	
	Rate per 100,000 population.	Rate per 100,000 population.	Decrease in the rate.	Average annual reduction in the number of deaths.
Boston	118.1	24.3	93.8	622
Chicago	130.6	33.0	97.6	2,109
Cincinnati	107.4	15.9	91.5	331
Detroit	163.4	31.6	131.8	597
New York (Man. and Bronx)	152.4	33.5	118.9	3,240
Memphis	41.5	15.4	26.1	53
Milwaukee	105.8	26.7	79.1	290
New Orleans	73.2	16.2	57.0	191
Philadelphia	107.4	29.7	77.7	1,193
St. Louis	117.7	21.5	96.2	655
San Francisco	89.5	12.2	77.3	319
Washington	66.0	9.7	56.3	185
Total (12 cities)	121.9	28.0	93.9	9,785

CHART II.

Mortality from Diphtheria and Croup

Fifteen American Cities

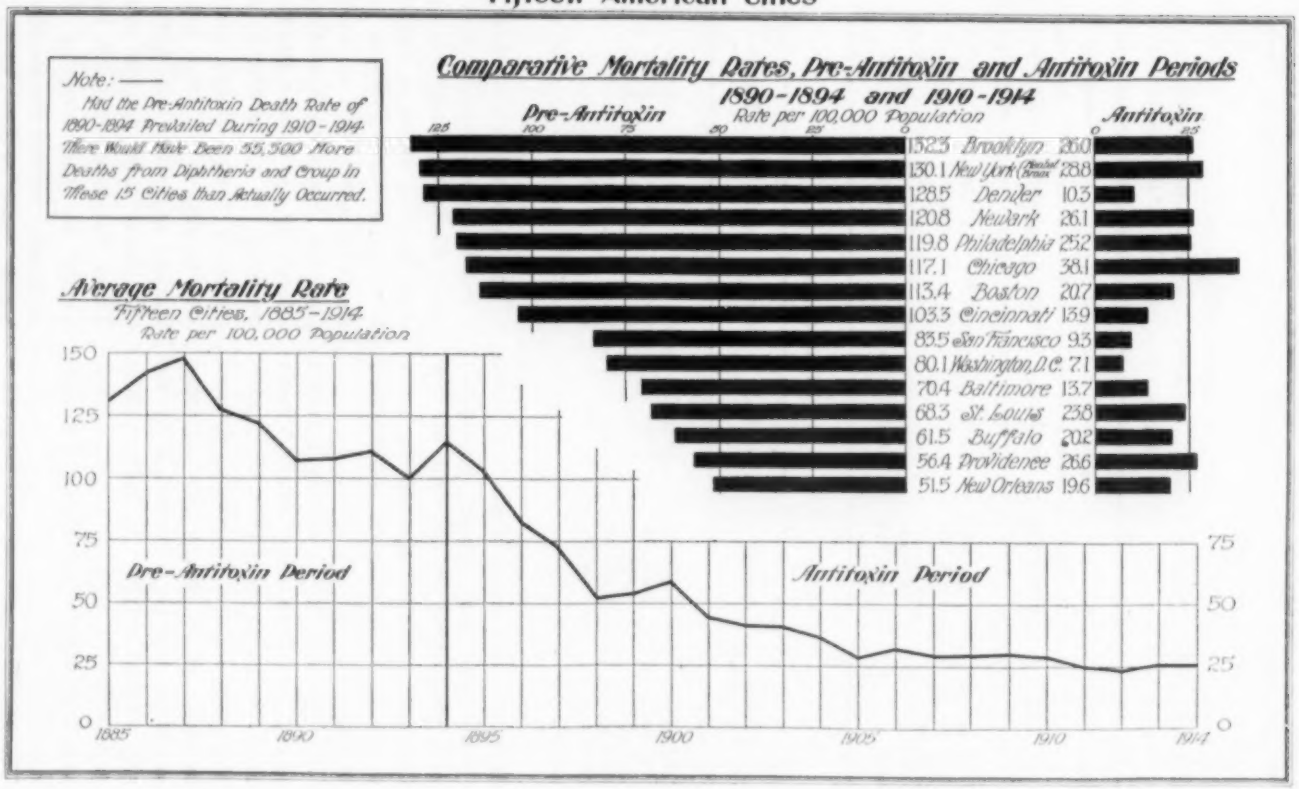


TABLE 3. MORTALITY FROM DIPHTHERIA AND CROUP IN OLD NEW YORK CITY (MANHATTAN AND BRONX BOROUGHS) WITH DISTINCTION OF SEX AND AGE, 1880-1915.

(Rates per 100,000 of Population.)

Under 5 Years of Age.

Years.	Males.			Females.		
	Population.	Deaths.	Rate.	Population.	Deaths.	Rate.
1880-84.....	361,613	4,631	1,280.7	357,550	4,355	1,218.0
1885-94.....	852,785	10,147	1,189.9	846,640	9,227	1,089.8
1895-04.....	1,165,780	5,627	482.7	1,158,380	5,174	446.7
1905-14.....	1,412,620	4,320	305.8	1,389,266	3,604	259.4
1915.....	154,754	305	197.1	151,594	280	184.7

5-14 Years of Age.

Years.	Population.	Deaths.	Rate.	Population.	Deaths.	Rate.
1880-84.....	607,911	1,024	168.4	612,545	1,135	185.3
1885-94.....	1,359,301	2,063	151.8	1,375,052	2,265	164.7
1895-04.....	1,818,820	1,103	60.6	1,836,225	1,290	70.3
1905-14.....	2,297,820	746	32.5	2,324,166	811	34.9
1915.....	254,211	67	26.4	257,653	75	29.1

diphtheria and croup in old New York (Manhattan and Bronx boroughs), with distinction of sex and for the two most important age periods, under 5 years and 5 to 14 years, is illustrated in Table 3.

In Newark, N. J., a very accurate record has been kept of diphtheria cases beginning with 1895 when antitoxin first began to be extensively used in that city.* From the beginning antitoxin has been furnished by the city without charge. In Table 4 there is presented a complete record of this somewhat unique experience of a large American city.

This table shows that there has been a much more favorable mortality in cases where antitoxin has been used than in cases where it was not used. Even in the first five-year period the antitoxin cases had a mortality 50 per cent. less than the others. It is interesting also to note that the fatality per cent. of the antitoxin cases has gradually been reduced from 13.5 in 1895 to only 4.4 in 1915, but no such marked reduction has taken place in the lethal rates of the other cases. These statistics have not been "doctored" by the omission from the antitoxin cases of the so-called "moribund" cases, or cases which terminate

*See Chart I, p. 447.

fatally within twenty-four hours. All cases treated with antitoxin are included under the heading "Antitoxin Used."

Hospital Statistics are even more convincing than general data as to the value of antitoxin as a life saver. The experience of the Boston City Hospital, Table 5, is a typical illustration of reduced fatality among diphtheria cases referred to hospitals for treatment. Many of these were severe cases, and often so far-advanced that tracheotomy or intubation was necessary. All statistics show that operative cases have a higher case fatality than non-operative cases. It is interesting to note that in the ten years previous to antitoxin the fatality per cent. was over 42.0, during 1895 to 1899 it dropped to 12.7, and it is now only 7.6.

TABLE 4. REDUCTION OF DIPHTHERIA MORTALITY IN NEWARK, N. J., AS THE RESULT OF ANTITOXIN, 1895–1915.

	Antitoxin used.			Antitoxin not used.		
Year.	Cases.	Deaths.	Fatality percentage.	Cases.	Deaths.	Fatality percentage.
1895	384	52	13.5	937	221	23.6
1896	905	106	11.7	356	112	31.5
1897	563	61	10.8	406	76	18.7
1898	646	68	10.5	373	65	17.4
1899	798	70	8.8	372	54	14.5
1895–99	3,296	357	10.8	2,444	528	21.6
1900	987	80	8.1	430	63	14.7
1901	956	58	6.1	198	45	22.7
1902	775	61	7.9	210	44	21.0
1903	953	71	7.5	197	49	24.9
1904	1,399	95	6.8	254	55	21.7
1900–04	4,970	365	7.3	1,289	256	19.9
1905	1,421	82	5.8	193	28	14.5
1906	1,171	72	6.1	102	27	26.5
1907	913	64	7.0	126	31	24.6
1908	726	49	6.7	80	17	21.3
1909	1,117	64	5.7	121	41	33.9
1905–09	5,348	331	6.2	622	144	23.2
1910	1,252	80	6.4	133	24	18.0
1911	1,247	56	4.5	92	18	19.6
1912	1,005	76	7.6	93	15	16.1
1913	1,489	89	6.0	105	21	20.0
1914	1,416	78	5.5	82	11	13.4
1910–14	6,409	379	5.9	505	89	17.6
1915	1,085	48	4.4	22	4	18.1

TABLE 5. MORTALITY FROM DIPHTHERIA AND CROUP IN THE BOSTON CITY HOSPITAL, 1885–1914.

Years.	Patients under treatment.	Deaths.	Fatality per-centage.
1885–89 ...	1,423	609	42.80
1890–94 ...	2,156	910	42.21
1895–99 ...	7,489	947	12.65
1900–04 ...	8,257	849	10.28
1905–09 ...	6,935	520	7.50
1910–14 ...	6,286	476	7.57

In old New York (Manhattan and Bronx boroughs) the case fatality of diphtheria and croup has decreased from 69.4 per cent. during 1880 to 1884 to 8.2 per cent. during 1915. The details are presented in the following table:

TABLE 6. CASE FATALITY OF DIPHTHERIA AND CROUP IN NEW YORK CITY (MANHATTAN AND BRONX BOROUGHS), 1880–1915.

Years.	Number of cases.	Number of deaths.	Fatality per-centage.
1880–84 ...	16,329	11,332	69.4
1885–94 ...	57,120	24,062	42.1
1895–04 ...	98,753	13,486	13.7
1905–14 ...	90,284	9,232	10.2
1915.....	9,109	750	8.2

The experience of the Metropolitan Asylums Hospitals of London conforms to the data available in this country, as it relates to improvement in the case fatality of diphtheria and croup. In the following table this English experience is summarized by 5-year intervals for the 25-year period, 1890 to 1914. It is interesting to note that if the same average percentage of deaths had obtained during 1910–1914 as in 1890–1894, there would have been 5,568 more deaths during 1910–1914 than actually occurred.

TABLE 7. RESULTS OF DIPHTHERIA CASES WITH REFERENCE TO ANTITOXIN TREATMENT—METROPOLITAN ASYLUMS HOSPITALS, LONDON, ENG., 1890–1914.

Years.	Number of cases.	Number of deaths.	Fatality per-centage.
1890–94 ...	10,777	3,196	29.7
1895–99 ...	29,058	4,928	17.0
1900–04 ...	31,774	3,549	11.2
1905–09 ...	24,733	2,275	9.2
1910–14 ...	25,179	1,910	7.6

There is positive and overwhelming evidence that the earlier the use of antitoxin in any given case the better the result and the greater the chance of recovery. Many statistics could be brought forward to support this conclusion, but Table 8, compiled from the annual reports of the Philadelphia Department of Health, must suffice for this country.

Two periods have purposely been taken, first to show that the same general results appear in both periods and, secondly to show that better results are being secured with continued improvements in the technique of antitoxin use. For the ten-year period, 1905 to 1914, it is shown that the case mortality when antitoxin was administered the first day of the onset of the disease was only 0.7 against 5.3 for the second day, 7.7 for the third,

TABLE 8. SUMMARY OF MORTALITY FROM DIPHTHERIA IN PHILADELPHIA, PA., BY DURATION OF THE DISEASE AT TIME OF ANTITOXIN TREATMENT.*

	1905–1909.			1910–1914.			1905–1914.
	Number of cases.	Number of deaths.	Fatality percentage.	Number of cases.	Number of deaths.	Fatality percentage.	Fatality percentage.
First day ...	415	...	....	443	5	1.1	0.7
Second day .	2,125	107	5.0	2,285	128	5.6	5.3
Third day ..	1,661	146	8.8	2,197	150	6.8	7.7
Fourth day..	999	124	12.4	1,409	108	7.7	9.6
Fifth day...	543	79	14.5	673	62	9.2	11.6
Sixth day...	381	52	13.6	462	43	9.3	11.3
After sixth day.....	637	91	14.3	595	68	11.4	12.9
Total	6,761	599	8.9	8,064	564	7.0	7.8

* These statistics are exclusive of diphtheria cases complicated with other infectious diseases. They are also exclusive of cases dying within 24 hours of treatment.

9.6 for the fourth, over 11 per cent. for the fifth and sixth days and 12.9 per cent. for such cases as were not treated with antitoxin until after at least six days duration of the disease. These statistics are strikingly significant of the importance of the early use of antitoxin and they also substantiate the now almost universally accepted claim that antitoxin is one of the main factors which have contributed to the decline in diphtheria mortality since 1894.†

The following quotation bears directly upon this point and is well worth a very careful reading by every physician and health official: "The death-rate among actual cases has been immensely lowered by the use of antitoxin. It is the duty of the State to place an adequate supply at the disposal of every practicing physician, to do everything possible to encourage its use and to provide for its administration to those who are unable to pay for the services of a private physician. This is all that can reasonably be expected from health officials. The further lowering of the death-rate rests absolutely in the hands of practicing physicians."‡

Discussing a paper on Diphtheria in Elementary Schools and Its Prevention, by J. Wright Mason, Medical Officer of Health, Kingston-upon-Hull, Dr. J. M. Clements of Hull, Eng., made the following statement: "The mortality among cases coming under my care from 1903 to 1906, classified according to the day of the disease on which serum treatment commenced, showed that of those coming under treatment on the first day the mortality was *nil;* second, 1.5 per cent.;

† See Chart I, p. 447.

‡ A Plea for the Early Use of Antitoxin in Diphtheria. Matthias Nicoll, Jr., M. D., *Health News*, November, 1915, N. Y. State Department of Health.

third, 8.0 per cent.; fourth, 15.7 per cent.; fifth, 19.8 per cent.; sixth, 24.0 per cent. These figures tallied very closely with the much larger figures collected by Doctor McCombie, of the Brook Hospital. They showed the great importance of giving serum early in the disease, and the large number of lives that would be saved if all cases came under antitoxin on the first or second day of illness." *

The State Department of Health of Pennsylvania for a number of years has made a systematic effort to extend the use of antitoxin, has furnished the serum free for dispensary use, and has kept a statistical record of the results achieved. The following tables should, therefore, be of general interest:

TABLE 9. RESULTS OF ANTITOXIN CURATIVE TREATMENT OF DIPHTHERIA, STATE OF PENNSYLVANIA, NOVEMBER 4, 1905 TO DECEMBER 31, 1912.†

Years.	Number treated.	Deaths.	Fatality percentage.
1905.....	293	38	12.97
1906.....	3,529	393	11.14
1907.....	5,271	376	7.13
1908.....	6,336	542	8.55
1909.....	5,365	416	7.75
1910.....	6,524	559	8.57
1911.....	7,793	510	6.54
1912.....	9,919	763	7.69
Total ...	45,030	3,597	7.99

† The total number of recoveries during the period, 1905–1912, was 41,433, or 92.01 per cent. of the cases treated.

Since 1906 the case fatality rates of antitoxin-treated cases have remained about the same from year to year and the rates indicate that there is too much delay in the use of the serum.

In the next table the results in Pennsylvania of antitoxin treatment for immunization purposes are presented for an eight-year period:

TABLE 10. RESULTS OF ANTITOXIN TREATMENT FOR IMMUNIZATION PURPOSES, STATE OF PENNSYLVANIA, NOVEMBER 4, 1905 TO DECEMBER 31, 1912.‡

Years.	Number treated.	Number developing diphtheria.	Deaths.	Fatality percentage in diphtheria cases.
1905....	155	5	..	....
1906....	2,334	77	3	3.90
1907....	3,799	34	2	5.88
1908....	3,965	45	8	17.78
1909....	4,847	109	3	2.75
1910....	5,194	87	6	6.90
1911....	6,906	125	4	3.20
1912....	8,581	94	3	3.19
Total	35,781	576	29	5.03

‡ Source: Report of Commissioner of Health, State of Pennsylvania, 1912, Part 2, p. 865.

The use of antitoxin to temporarily immunize susceptible individuals in diphtheria epidemics or in scarlet fever patients segregated in hospitals is likely to play a very important rôle in the future. As Dr. William H. Park and others have pointed out this is now made feasible by the perfection of the technique of the Schick test. There is already sufficient evidence to indicate that along this line of effort lies the hope that antitoxin may prove quite as important in preventing diphtheria as in curing it. To date there is no conclusive evidence that diph-

* Transactions of the Sanitary Institute, June, 1908, pp. 227–8.

theria morbidity has decreased, but there can be no reasonable doubt that its mortality has declined and mainly as the direct result of antitoxin treatment.

Notwithstanding the great reduction in the diphtheria death-rate as a direct result of antitoxin, better diagnosis, more general hospital care, etc., diphtheria is still responsible for at least three per cent. of the total mortality at ages under 15 years in the countries of the temperate zones for which reliable vital statistics are available. In the registration area of the United States this percentage is 4.4; in England and Wales it is 2.9; in Norway, 6.0; in Austria, 4.5; and in Bavaria, 3.1.

Diphtheria still causes more deaths in the United States than whooping-cough, measles or scarlet fever. This disease, therefore, still remains a distinct menace to children notwithstanding antitoxin, its specific curative agent. The average annual number of deaths from diphtheria and croup in the United States is approximately 17,000, against 10,000 from whooping-cough, 9,000 from measles and 8,000 from scarlet fever. In Table 11 the relative importance of these four diseases is clearly set forth and with distinction of age.

It is interesting to note that diphtheria and croup causes a larger percentage (3.3) of the total mortality at ages under five years than any of the

TABLE 11. COMPARATIVE MORTALITY FROM DIPHTHERIA AND CROUP, WHOOPING-COUGH, MEASLES, AND SCARLET FEVER. REGISTRATION AREA, U. S., 1910–1914.

Age.	Diphtheria and Croup.			Whooping-cough.		
	Deaths.	Percentage distribution by age.	Percentage of total deaths, all causes.	Deaths.	Percentage distribution by age.	Percentage of total deaths, all causes.
Under 5 years ...	35,691	62.2	3.3	30,074	95.2	2.8
5–9 years.....	14,871	25.9	16.0	1,167	3.7	1.3
10–19 years	4,497	7.8	2.8	175	0.5	0.11
20 and over	2,355	4.1	0.08	179	0.56	0.01
All ages.....	57,414	100.0	1.34	31,595	100.0	0.74
	Measles.			Scarlet Fever.		
Under 5 years ...	23,649	80.6	2.2	13,685	53.9	1.3
5–9 years.....	2,446	8.3	2.6	7,176	28.3	7.7
10–19 years	1,233	4.2	0.8	2,881	11.4	1.8
20 and over	2,001	6.8	0.07	1,632	6.4	0.05
All ages.....	29,329	100.0	0.68	25,374	100.0	0.59

other three diseases, whooping-cough being second with 2.8 per cent., measles third with 2.2 per cent. and scarlet fever fourth with 1.3 per cent. At ages 5 to 9 years diphtheria and croup causes no less than 16.0 per cent. of the total mortality from all causes at those ages, scarlet fever is second with 7.7 per cent.; measles is third with 2.6 per cent. and whooping-cough is fourth with only 1.3 per cent. At ages 15 to 19 years diphtheria and croup causes 2.8 per cent. of the total mortality, scarlet fever 1.8 per cent., measles 0.8 per cent. and whooping-cough only 0.11 per cent. At the adult ages, 20 years and over, no one of these four diseases causes as much as one-tenth of one per cent. of the total mortality.*

This comparison is interesting also from the viewpoint of age distribution of the deaths. Diphtheria and croup, in this respect, resembles scarlet fever more closely than measles or whooping-cough. A greater proportion of the whooping-cough deaths occur at ages under five years (95.2 per cent.) than is true of any of the other three causes. Measles is second with 80.6 per cent., diphtheria is third with 62.2 per cent. and scarlet fever is fourth with 53.9 per cent. At the other age extreme, 20 years and over, measles stands first with 6.8 per cent. of its deaths occurring at those ages, scarlet fever is a close second with 6.4 per cent., diphtheria is third with 4.1 per cent. and whooping-cough is a poor fourth with only 0.56 per cent. of its total mortality falling within the age period 20 years and over.

*See Chart V, p. 470.

Geographical Distribution.

Diphtheria, so far as can be determined from official reports, is world-wide in its distribution. The average annual death-rates from this disease differ widely in the various countries in any given period of time. Just what the underlying factors are which contribute to this result and what their relative importance is still a more or less baffling mystery. Temperature is probably the climatic factor of most importance in determining the extent of the spread of diphtheria and its seasonal prevalence. Clemow concludes "That temperature is a powerful factor in determining the distribution of this disease, and that extremes of heat or cold are unfavorable to its prevalence." He concludes that "Heat is probably more unfavorable than cold, for while diphtheria is found as a severe epidemic in no tropical country, it is endemic and a cause of high mortality in such cold countries as Norway and Sweden. Clemow was well aware also that "Diphtheria in many temperate countries is found to be most active in the autumn and winter, and least so in the warm summer months." †

Many writers, including Longstaff, Newsholme, Creighton, and Marsden, have sought to establish a correlation between diphtheria epidemics and a succession of dry years; in other words, an inverse or negative correlation between diphtheria mortality and a high level of ground water. In England and Wales this negative correlation is high, or more than −0.6. In

†Clemow, The Geography of Disease, p. 145.

Norway, however, the factor of inverse correlation is insignificant and the same is true of Newark, N. J., although long periods of years have been taken in both these latter cases. Rainfall may be a conditioning factor in diphtheria prevalence, but it evidently is only one of many, for there are numerous and important exceptions to its dominating influence.* Altitude and soil have been considered by some authorities to have an important effect on the diffusion of diphtheria but nothing like definite proof is yet possible from the available statistics of this disease.

The seasonal prevalence of diphtheria in most temperate climates is probably associated with bad ventilation and closer contact of larger numbers of susceptible persons in schools, houses, etc., in the winter than in the summer season. Whatever the cause, it is almost universally true that diphtheria cases in Northern latitudes reach a minimum in August or September, then gradually increase throughout the late fall and winter, attaining a maximum or high crest in April or May. Some writers attribute a large part of this school-season diphtheria to compulsory school attendance but Newsholme, Chapin and others have repeatedly pointed out that the great majority of the cases of diphtheria are of children under school age. The seasonal prevalence of diphtheria and croup in Greater New York is illustrated in the accompanying Chart III, page 458. The weekly rates of cases and deaths in New York City are typical of those for any large American city.

Just as the seasonal distribution of diphtheria may possibly be correlated with closer and more confined grouping of the population in schools, houses, shops, etc., so the more general close-crowding of population in cities as compared with rural areas seems to afford a ready explanation for some of the comparative differences in the death-rates from diphtheria.

In the United States the diphtheria mortality is at present considerably higher in the urban than in the rural areas,† as is clearly shown in Table 12.

In every one of the fifteen years, 1900 to 1914, the urban death-rate has been materially higher than the rural rate. It is significant also to note that comparing the death-rates for the first and last five-year periods the average annual death-rate in the urban area has declined from 42.8 per 100,000 population during 1900 to 1904 to 21.7 during 1910 to 1914, or nearly 50.0 per cent., while the decline in the rural rate has been from 20.1 to 15.0, or only 25.0 per cent. The urban death-rate is being so well controlled by antitoxin treatment that it is probable that it will soon be no more than equal to or even lower than the rural death-rate.

The geographical distribution of diphtheria mortality in the United States during the fifteen-year period, 1900 to 1914, is succinctly set forth in Tables 13 and 14, pp. 460 and 461.

These tables show a progressive increase in the rate from the west east-

*In testing out these correlations, I have had the assistance of Mr. Arne Fisher, one of my co-workers, and author of the well-known work on the Mathematical Theory of Probabilities.

†See Chart I, p. 447.

CHART III.

Seasonal Prevalence of Diphtheria and Croup

New York City, 1911 to 1915

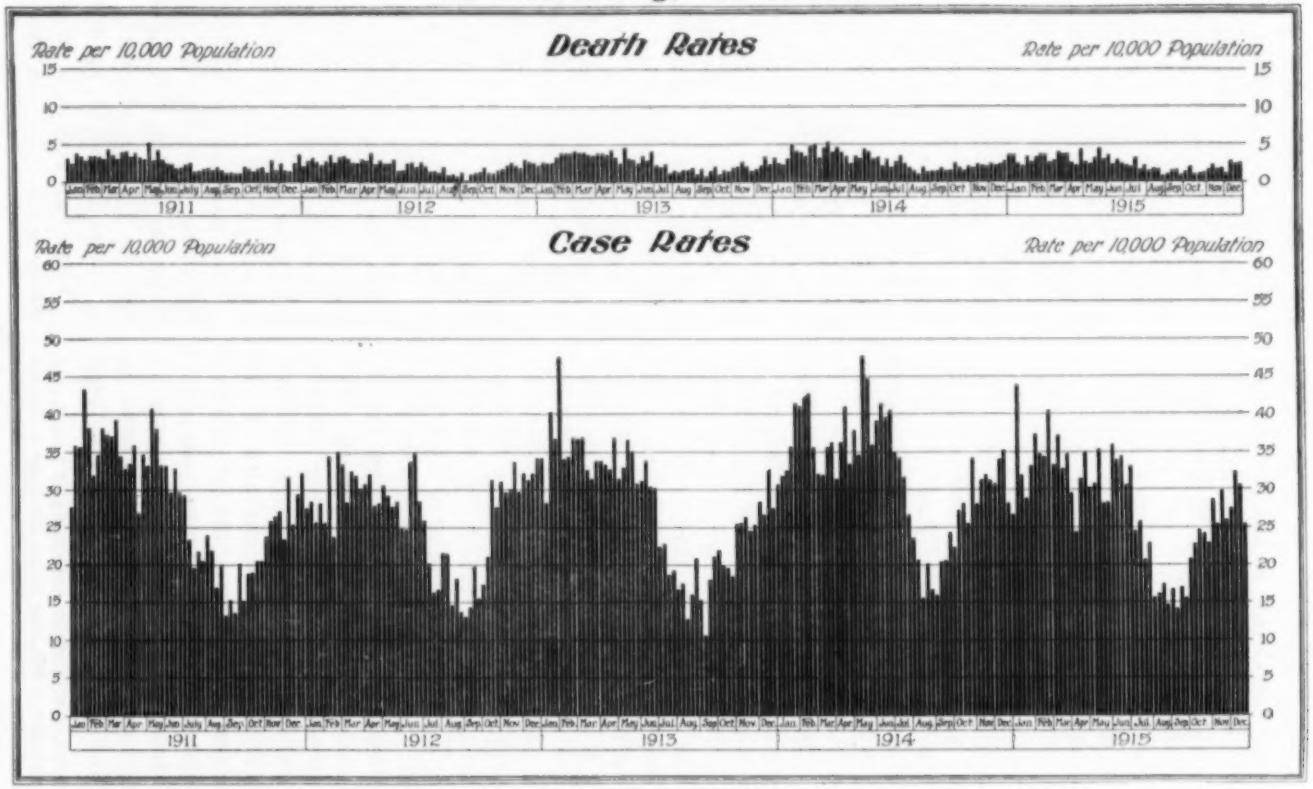


TABLE 12. MORTALITY FROM DIPHTHERIA AND CROUP IN THE REGISTRATION AREA OF THE UNITED STATES WITH DISTINCTION OF URBAN AND RURAL AREAS, 1910–1914.

	Urban.*			Rural.		
	Population.	Deaths.	Rate per 100,000.	Population.	Deaths.	Rate per 100,000.
1900	10,675,611	5,591	52.4	9,289,538	2,465	26.5
1901	11,188,101	4,816	43.0	9,118,942	1,966	21.6
1902	11,477,929	4,568	39.8	9,171,012	1,560	17.0
1903	11,754,911	4,878	41.5	9,235,930	1,638	17.7
1904	12,029,302	4,623	38.4	9,307,413	1,634	17.6
1900–04	57,125,854	24,476	42.8	46,122,835	9,263	20.1
1905	12,372,228	3,712	30.0	9,364,680	1,408	15.0
1906	18,195,041	5,815	32.0	15,640,988	3,076	19.7
1907	18,737,525	5,493	29.3	15,871,371	2,873	18.0
1908	20,417,270	5,455	26.7	18,288,591	3,021	16.5
1909	23,066,405	5,632	24.4	21,215,280	3,182	15.0
1905–09	92,788,469	26,107	28.1	80,380,910	13,560	16.9
1910	25,187,805	6,482	25.7	22,619,961	3,608	16.0
1911	27,485,457	5,883	21.4	26,899,777	4,075	15.1
1912	28,129,824	5,502	19.6	27,122,299	4,207	15.5
1913	29,244,160	6,324	21.6	29,068,435	4,280	14.7
1914	30,287,640	6,320	20.9	30,826,560	4,243	13.8
1910–14	140,334,886	30,511	21.7	136,537,032	20,413	15.0

* By urban is meant all municipalities of 10,000 or more population.

ward and from the south northward, density of population, with all that it implies, apparently playing an important rôle in the geographical distribution of diphtheria mortality. In the southern states, however, the mild climate and more general out-of-doors life and the large negro population are factors which doubtless operate to keep the diphtheria death-rate lower than in the north, entirely aside from the question of relative population density. On the Pacific coast also the generally mild climate with rainy season intervals may account in part, at least, for the comparatively low diphtheria death-rate.

Epidemicity.

Newsholme has probably written the best and most comprehensive work on the epidemicity of diphtheria.† He brings forward abundant evidence to support the theory that this disease is epidemic in character and has now become endemic and pandemic in most, if not all, the temperate countries of the world. The statistics of the United States which were drawn upon

† Epidemic Diphtheria, by Arthur Newsholme, M. D., London, 1898.

TABLE 13. MORTALITY FROM DIPHTHERIA AND CROUP IN THE UNITED STATES, REGISTRATION STATES, POPULATION AND DEATHS, AGES UNDER 20, 1910–1914.

	Population.	Deaths.	Rate per 100,000 population.
9 Eastern States:			
Maine	1,363,083	425	31.2
New Hampshire	760,720	320	42.1
Vermont	652,853	137	21.0
Massachusetts	6,258,765	2,945	47.1
Rhode Island	1,057,367	647	61.2
Connecticut	2,141,857	1,138	53.1
New York	17,399,602	9,602	55.2
New Jersey	5,159,810	2,915	56.5
Pennsylvania	16,059,381	10,061	62.6
Total	50,853,438	28,190	55.4
4 Southern States:			
Maryland	2,691,459	887	33.0
Virginia (1913 and 1914)	2,032,531	625	30.7
North Carolina	886,114	287	32.4
Kentucky (1911 and 1914)	4,332,033	2,355	54.4
Total	9,942,137	4,154	41.8
7 Central States:			
Ohio	9,218,466	4,028	43.7
Indiana	5,360,838	2,111	39.4
Michigan	5,668,623	2,443	43.1
Minnesota	4,524,888	1,437	31.8
Wisconsin	5,094,066	1,453	28.5
Missouri (1911–1914)	5,500,431	2,489	45.3
Kansas (1914)	747,872	159	21.3
Total	36,115,184	14,120	39.1
3 Rocky Mountain States:			
Colorado	1,602,620	393	24.5
Montana	712,062	145	20.4
Utah	930,115	245	26.3
Total	3,244,797	783	24.1
2 Pacific Coast States:			
California	3,994,562	920	23.0
Washington	2,249,047	375	16.7
Total	6,243,609	1,295	20.7
Grand total (25 Registration States)	106,399,165	48,542	45.6

TABLE 14. GEOGRAPHICAL DISTRIBUTION OF THE MORTALITY FROM DIPHTHERIA AND CROUP IN ONE HUNDRED CITIES OF THE UNITED STATES, 1900–1914.

Geographical areas.	Number of cities.	Aggregate population.	Number of deaths from diphtheria and croup.	Death-rate per 100,000 total population.
Middle Atlantic	29	136,554,575	49,442	36.2
New England	20	35,305,335	10,496	29.7
East Central	16	66,638,804	19,077	28.6
West Central	9	30,294,114	7,921	26.1
Rocky Mountain	3	4,689,215	1,170	25.0
Southern	16	35,383,983	6,064	17.1
Pacific Coast	7	15,989,672	2,575	16.1

extensively by Newsholme in 1898 are even more conclusively confirmatory today of his main thesis that diphtheria, although endemic and pandemic is still epidemic both in a local and in a universal sense. There is evidence that diphtheria epidemics spread in great waves and that possibly they are favored by certain climatic and meteorological conditions, even though personal infection is the most important single factor in the spread of diphtheria infection. Anything like an exhaustive statistical reëxamination of the epidemic character of diphtheria is beyond the scope of this paper, and is quite unnecessary in view of Newsholme's work. In this connection, however, it is interesting to note that in each of 100 cities of the United States during a period of fifteen years,

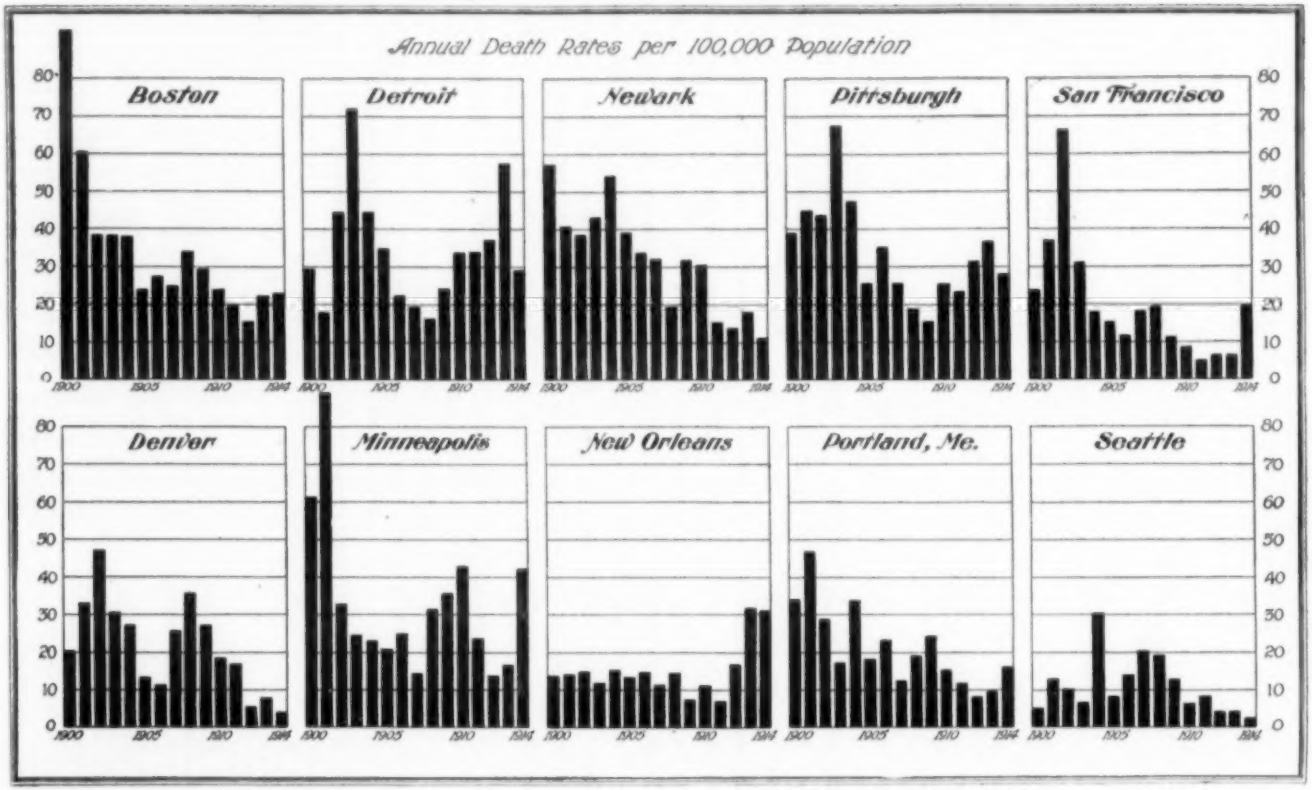
TABLE 15. MORTALITY FROM DIPHTHERIA, TWENTY REPRESENTATIVE AMERICAN CITIES, 1900–1914.

(Death-rates per 100,000 Population, All Ages.)

Cities.	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914
Baltimore	57.4	33.2	24.3	29.4	21.2	17.6	20.8	14.7	12.0	13.7	11.4	12.0	15.8	15.0	14.8
Boston	92.4	60.2	38.3	38.2	37.9	23.9	27.4	24.8	33.9	29.5	23.9	19.7	15.3	22.1	22.9
Charleston, S. C.	19.7	17.8	14.2	3.5	8.8	5.2	5.2	12.1	1.7	8.5	13.6	8.4	6.7	5.0	6.7
Chicago	49.6	28.6	34.7	34.2	21.4	22.3	27.5	27.1	26.5	31.7	37.4	38.2	41.2	41.2	32.2
Cincinnati	27.9	21.6	23.2	18.4	13.3	22.6	22.5	14.9	15.9	11.4	9.9	12.2	15.7	13.1	18.2
Denver	20.2	33.1	47.0	30.4	27.3	13.4	11.3	25.9	35.4	27.0	18.6	16.7	5.6	8.0	4.1
Detroit	29.1	18.0	44.4	71.7	44.4	34.7	22.6	19.6	16.1	24.3	33.8	33.9	37.1	57.6	29.2
Fall River	23.8	23.8	47.5	40.8	27.5	26.5	25.7	20.6	19.2	17.1	19.2	22.0	26.1	27.4	20.7
Minneapolis	61.2	89.0	32.7	24.8	23.2	21.0	25.1	14.3	31.4	35.6	42.9	23.8	13.9	16.8	42.2
Newark	57.3	40.8	38.8	43.1	54.2	39.2	33.9	32.2	19.5	31.7	30.6	15.7	14.1	18.2	11.1
New Orleans	13.9	14.3	14.8	11.9	15.2	13.4	14.7	11.4	14.6	7.5	10.9	7.2	16.5	31.7	31.0
New York (Greater)	65.7	56.2	54.7	55.1	52.7	37.3	44.4	39.3	38.1	36.7	35.6	25.6	22.3	26.1	28.3
Philadelphia	85.1	49.2	38.4	44.9	39.1	32.7	39.0	33.5	32.5	33.4	30.8	31.1	23.7	21.5	19.4
Pittsburg	39.0	44.8	43.5	67.3	47.7	25.6	35.1	25.3	18.8	15.5	25.4	23.4	31.2	36.6	28.0
Portland, Me.	33.9	47.0	28.9	17.1	33.6	18.4	23.5	12.5	19.3	24.2	15.3	11.7	8.3	9.8	16.1
Providence	31.3	47.7	39.0	44.3	45.9	36.2	25.0	32.0	36.8	26.3	21.7	24.7	32.7	29.6	24.1
St. Louis	66.8	47.3	29.6	32.3	27.4	25.6	17.7	17.4	19.0	26.0	16.1	17.6	21.2	29.2	34.7
San Francisco	23.9	37.0	66.4	31.2	18.2	15.5	11.8	18.4	19.6	11.2	8.8	5.2	6.7	6.6	19.4
Seattle	5.0	12.8	10.4	6.8	30.1	8.5	14.2	20.2	19.5	13.0	6.3	8.7	4.3	4.4	2.2
Washington, D. C.	43.4	36.6	17.3	8.5	17.3	16.0	13.5	9.2	8.4	14.4	9.3	5.6	4.4	7.8	8.2

CHART IV.

Mortality from Diphtheria and Croup



1900 to 1914, there was one or more deaths from diphtheria every year, with only one exception. During this period of fifteen years the annual diphtheria death-rates of the 100 cities (1500 rates) varied from zero, in the one exceptional case, to 173 per 100,000 of population. Practically every one of the cities also presented evidence of the epidemic character of diphtheria in the varying annual death-rates during the fifteen-year period. These facts are illustrated for ten representative cities in Chart IV, page 462. The detail statistics upon which that chart is based are presented in Table 15, p. 461, which includes the data for twenty of the one hundred cities previously referred to and embraces the ten cities represented in Chart IV.

Race.

Hirsch directed attention to the probability that there is no complete racial immunity to diphtheria.* He stated, however, that "in several of the epidemics in the United States, the negro children, who live under the most unfavorable conditions, have enjoyed a striking immunity from the disease."† Hoffman in his "Race Traits and Tendencies of the American Negro" called attention to the probably lesser liability of the colored race (negroes) to diphtheria and croup as compared with the white population.‡ Clemow remarks that "all the great divisions of the human family, including pure Mongols and full-blooded negroes, seem to be capable of becoming subjects of the disease, though probably both their susceptibility to attack and their power of recovery when attacked vary greatly. In China, for example, the disease is said to be much more intense and fatal in natives than in European residents, while in the United States the white races suffer much more than the black."§

In a very recent analysis of 3,778 deaths from scarlet fever in the Metropolitan Life Insurance Company's experience, Dublin has pointed out that the mortality was "markedly lower" for the colored than for the whites,‖ and as scarlet fever follows closely in many respects the sex, age, and race characteristics of diphtheria it is safe to assume that the Metropolitan's experience with diphtheria will confirm that available in the general mortality of American cities and states.¶

In thirty southern cities combined, during the five years, 1909–1913, the average annual death-rate of the white population from diphtheria and croup was 13.7 per 100,000 of population, against an average rate of only 8.1 for the negro population. In Washington, D. C., the comparative data have been recorded for a number of years and include reported cases of diphtheria and croup as well as deaths. As Table 16 shows, the attack rates, as well as the death-rates, have been considerably higher for the white than

* Handbook of Geographical and Historical Pathology, by Dr. August Hirsch, Vol. III, p. 106, London, 1886.

† *Ibid.*, p. 110.

‡ Race Traits and Tendencies of the American Negro, by Frederick L. Hoffman, pp. 113–115. The MacMillan Co., N. Y., 1896.

§ The Geography of Disease, by Frank G. Clemow, M. D., D. P. H., p. 146. Cambridge, Eng., 1903.

‖ A Study of 1,153 Cases of Scarlet Fever, by Louis I. Dublin, Ph. D., 1916.

¶ See Chart I.

TABLE 16. ATTACK- AND DEATH-RATES FROM DIPHTHERIA AND CROUP IN WASHINGTON, D. C., BY AGE AND RACE, 1908–1915.

(Rates per 10,000 Population.)

Age.	Population.	Cases.	Attack-rate.	Deaths.	Death-rate.
White.					
Under 1 year	33,122	66	19.9	8	2.42
1–4 years	126,643	700	55.3	86	6.79
5–9 years	150,024	1,118	74.5	51	3.40
10–19 years	303,947	788	25.9	10	0.33
20 and over	1,328,794	551	4.1	9	0.07
All ages	1,942,530	3,223	16.6	164	0.84
Colored.					
Under 1 year	11,591	13	11.2	4	3.45
1–4 years	47,906	87	18.2	21	4.38
5–9 years	58,724	144	24.5	11	1.87
10–19 years	129,815	347	26.7	5	0.39
20 and over	520,804	144	2.8	5	0.10
All ages	768,840	735	9.6	46	0.60

for the colored population, except at ages 10 to 19 years when the rates have been about the same for white and colored. The attack rate for all ages combined, during the eight-year period, 1908 to 1915, was 16.6 per 10,000 white population as against only 9.6 for the colored. The comparative death-rates were 0.84 per 10,000 white population as against 0.60 for the colored.

The comparative mortality from diphtheria and croup of the white and colored races of Cuba are presented in Table 17 for the period 1910 to 1913, and according to age. These Cuban data show a white death-rate, ages 1 to 9 years, more than double the negro rate. The deaths for the other age periods are too few to give trustworthy rates.

The case-fatality is possibly markedly higher among negroes than among whites. At least that is the deduction to be made from the following statistics in Table 18, compiled from the excellent reports of the Health Department of Washington, D. C.

It is quite possible that some of these differences in the comparative case fatality may be the result of less complete reporting of negro cases of diphtheria. Probably, however, they are more readily to be explained as the result of less prompt and adequate treatment of the negro cases, with antitoxin and otherwise.

Only fragmentary data are available

TABLE 17. MORTALITY FROM DIPHTHERIA AND CROUP, BY AGE AND RACE, IN CUBA, 1910–1913.*

Ages.	White.			Colored.		
	Population.	Deaths.	Rate per 100,000 population.	Population.	Deaths.	Rate per 100,000 population.
Under 1 year....	211,666	47	22.2	78,162	19	24.3
1–9 years.....	1,582,867	501	31.7	673,895	99	14.7
10–19 years	1,290,978	20	1.5	579,488	7	1.2
20 years and over	3,315,086	7	0.2	1,450,925	6	0.4
All ages.....	6,400,597	575	9.0	2,782,470	131	4.7

* Source: Sanidad y Benificencia, Boletin Oficial de la Secretaria, Habana.

TABLE 18. DIPHTHERIA AND CROUP, WHITE AND COLORED, WASHINGTON, D. C.

Years.	White.			Colored.		
	Cases.	Deaths.	Case fatality percentage.	Cases.	Deaths.	Case fatality percentage.
1896–1905.....	4,913	625	15.0	1,299	306	23.6
1906–1915.....	3,969	212	5.7	820	62	7.6
Total.....	8,882	837	9.4	2,119	368	17.4

to show the relative susceptibility of the American Indian to diphtheria and croup but so far as they go they indicate a lesser degree of susceptibility than for the Caucasian race. Chinese and Japanese, Hawaiians, Filipinos and Mexicans all are susceptible to diphtheria, and apparently equally so with Caucasians.

According to a special tabulation of the U. S. Bureau of the Census for the year 1910, out of a total of 886 deaths of Indians from all causes, only 3 were from diphtheria and croup; out of a total of 1,055 deaths of Chinese for the same year and same area (U. S. Registration area) there were 8 deaths from diphtheria and croup and out of 664 deaths of Japanese from all causes during the same year and for the same area, there were 3 deaths from diphtheria and croup. The child population, however, is a much more important element in the Indian than in either the Chinese or Japanese populations of the United States.

During this same year and for the same area there were reported 25 deaths of Indians from measles, 3 deaths from scarlet fever and 25 deaths from whooping-cough; among the Chinese there were reported 2 deaths from measles, no death from scarlet fever and 1 death from whooping-cough; among the Japanese there were reported 1 death from measles, no death from scarlet fever, and 10 deaths from whooping-cough. It is the opinion of Indian agency physicians that diphtheria is infrequently met with among Indians, and it is very infrequently noted on the agency morbidity reports.* During the six-year period, 1888 to 1893, only 325 cases of diphtheria were reported by Indian agency physicians of the United States as against 4,003 cases of whooping-cough and 7,805 cases of measles in the same Indian population.†

The mortality of Chinese from diphtheria in San Francisco, 1910–1914, according to a special investigation into the mortality of the Chinese in that city during the five-year period, 1910–1914, was as follows: 4 deaths from diphtheria, of which 3 occurred at ages under 15, and 1 in the age group 15–39. There were no deaths from diphtheria reported among the female Chinese population, but that population, is of course, quite limited in number.

According to a special investigation into the mortality of Mexicans in the cities of San Diego, Los Angeles, El Paso and San Antonio during the five-year period, 1910–1914, the mortality from diphtheria among Mexicans in these cities was as follows: *Males*, ages under 15 years, 38 deaths; 15–44 years, no deaths; 45 and over, no deaths; total, 38 deaths, or 0.6 per cent. of the deaths from all causes among male Mexicans. *Females*, ages under 15 years, 36 deaths; 15 to 44 years, 5 deaths; 45 and over, no deaths; total, 41 deaths, or 0.8 per cent. of the reported deaths of female Mexicans from all causes.

Becaus of their general interest and as bearing directly upon the question of relative racial susceptibility Tables 19 and 20 for the city of Manila and for the Hawaiian Islands are included.

Sex.

Thorne stated in 1894 that "Sex appears to have some slight influence in determining a liability to the disease (diphtheria) though it is not well marked. We find that more females die from the disease than males, but I have thought that this arises mainly from the fact that females are more exposed to infection than males. Little girls, when they are sick, are not nursed by little boys, but little boys are often nursed by little girls, and this care for the sick by females holds good in adult life. Men do not usually nurse women suffering from diphtheria, whereas males thus affected are usually nursed by women. A fallacy therefore underlies the figures bearing on the incidence of the disease as it affects the sexes, in so far as the mere influence of sex is concerned."‡

* Contagious and Infectious Diseases Among the Indians. Senate Document, No. 1038, pp. 57 and 58. Washington, D. C., 1913.

† Statistics compiled from the annual reports of the U. S. Commissioner of Indian Affairs.

‡ The Etiology, Spread and Prevention of Diphtheria, by R. Thorne Thorne, Sanitary Institute, April, 1894.

TABLE 19. MORTALITY FROM DIPHTHERIA AND CROUP IN THE CITY OF MANILA, P. I., BY RACES, 1905–1914.

Race.	Total population.	Population under 20.	Deaths.	Rate per 100,000	
				Total population.	Population. under 20.
American	47,585	5,948	3	6.3	50.4
Chinese	176,065	10,388	..	..	..
Filipino	2,108,016	834,775	77	3.7	9.2
All others	47,586	25,506	1	2.1	3.9
Total	2,379,253	876,617	81	3.4	9.2

TABLE 20. MORTALITY FROM DIPHTHERIA AND CROUP IN HAWAII, BY RACES, JULY 1, 1911 TO JUNE 30, 1915.

Race.	Total population.	Population under 20.	Deaths.	Rate per 100,000	
				Total population.	Population under 20.
Hawaiian	99,423	39,670	10	10.1	25.2
Part-Hawaiian	55,804	36,831	6	10.8	16.3
Chinese	83,723	24,196	9	10.7	37.2
Japanese	344,435	97,475	43	12.5	44.1
Portuguese	94,093	53,445	14	14.9	26.2
Other Caucasian	123,820	44,947	15	12.1	33.4
All others	68,833	20,306	3	4.4	14.8
Total	870,131	316,870	100	11.5	31.6

Longstaff states that he found the total female mortality from diphtheria to be seven per cent. in excess of the male mortality in England after population differences were allowed for. His statistics also showed that this excessive female mortality occurred mainly between the fifth and fifteenth years of age.*

Creighton states that "Diphtheria is the only epidemic disease besides whooping-cough which is more fatal to females than to males in proportion to the numbers of each sex living."†

For England and Wales during the five-year period, 1909 to 1913, the comparative death-rates of males and females are shown in detail, and with distinction of age, in Table 21. The percentage distribution, by age, of the deaths from diphtheria and croup dur-

* Studies in Statistics, Longstaff, p. 336.

† History of Epidemic Diseases of Britain, Vol. II, p. 743.

ing this five-year period is also shown for each sex.

In view of the various observations of English writers, previously quoted, it is interesting to note that, according to this table, the general mortality rate has been practically the same for both sexes, but slightly higher for males than for females or as 13.2 to 13.0 per 100,000 of population. When the death-rates are studied by age, however, the female death-rate is seen to be distinctly higher than the male rate at ages 5–9 years, 10–14 years and 20 years and upward. At age 4 years also the female rate was slightly higher than the male rate, but at ages under 4 years and at ages 15 to 19 years the male death-rates were distinctly higher than the female rates for the corresponding ages.

The data for the registration area of the United States, for the five-year period, 1910 to 1914, exhibit much the same sex differences as the English

TABLE 21. MORTALITY FROM DIPHTHERIA AND CROUP, ENGLAND AND WALES, 1909–1913.

Age at death.	Population.	Deaths.	Rate per 100,000.	Percentage distribution of deaths by age.	
Under 1 year	1,981,051	632	31.9	5.5	
1 year	1,875,220	1,417	75.6	12.3	
2 years	1,985,424	1,474	74.2	12.8	
3 years	1,948,689	1,679	86.2	14.6	
4 years	1,916,328	1,582	82.6	13.8	
Under 5 years	9,706,712	6,784	69.9	59.0	
5–9 years	9,261,522	3,736	40.3	32.5	
10–14 years	8,762,105	621	7.1	5.4	
15–19 years	8,296,798	134	1.6	1.2	
20 years and over	51,436,477	230	0.4	1.9	
All ages	87,463,614	11,505	13.2	100.0	
	Females.				Ratio of female deaths to every 100 males.
Under 1 year	1,938,462	468	24.1	3.9	76
1 year	1,848,822	1,259	68.1	10.4	90
2 years	1,972,080	1,328	67.3	10.9	91
3 years	1,948,734	1,607	82.5	13.2	96
4 years	1,909,517	1,627	85.2	13.4	103
Under 5 years	9,617,615	6,289	65.4	51.8	94
5–9 years	9,272,128	4,740	51.1	39.0	127
10–14 years	8,783,777	705	8.0	5.8	113
15–19 years	8,430,820	122	1.4	1.0	88
20 years and over	57,270,561	296	0.5	2.4	125
All ages	93,374,901	12,152	13.0	100.0	98

data, as is evident from the following table:

TABLE 22. MORTALITY FROM DIPHTHERIA AND CROUP IN THE REGISTRATION AREA, U. S., BY SEX AND AGE, 1910–1914.

(Rates per 100,000 Population at Specified Ages.)

Males.

Age.	Population.	Deaths.	Rate.
Under 1 year...	3,337,487	2,523	75.6
1 year.....	2,974,647	5,062	170.2
2 years.....	3,262,362	4,555	139.6
3 years.....	3,224,000	4,004	124.2
4 years.....	3,185,638	3,059	96.0
Under 5 years..	15,984,134	19,203	120.1
5–9 years.....	14,377,589	7,278	50.6
10–14 years....	13,793,089	1,598	11.6
15–19 years....	14,314,597	532	3.7
20 years and over.....	97,320,276	1,055	1.1
Ages unknown	.....	7	....
All ages	155,789,685	29,673	19.0

Females.

Age.	Population.	Deaths.	Rate.
Under 1 year...	3,244,399	2,010	62.0
1 year.....	2,892,390	4,101	141.8
2 years.....	3,169,636	4,014	126.6
3 years.....	3,177,424	3,419	107.6
4 years.....	3,091,757	2,944	95.2
Under 5 years..	15,575,606	16,488	105.9
5–9 years.....	14,112,881	7,533	53.4
10–14 years....	13,587,263	1,828	13.5
15–19 years....	14,352,867	539	3.8
20 years and over.....	89,416,715	1,335	1.5
Ages unknown	.....	18	.....
All ages	147,045,332	27,741	18.9

According to this table, the male death-rate from diphtheria and croup was higher than the female rate at ages under five years; the female death-rate was higher than the male rate at ages 5 to 9 years and 10 to 14 years; the rates for the two sexes were practically the same at 15 to 19 years; and the female death-rate was distinctly higher at ages 20 years and over. When all ages are combined the general death-rate of males from diphtheria and croup is shown to have been 19.6 per 100,000 of aggregate male population, against a female rate of 19.3 per 100,000 of aggregate female population.

The higher female mortality from diphtheria at adult ages finds its most likely explanation in the nursing service of mothers, professional female nurses, etc. The higher mortality rate of diphtheria among boys at ages under five years is explainable as following the general rule that the mortality rate of infant and youthful males is higher than that of females, for almost all causes, with the notable exception of whooping-cough. The sex differences in diphtheria mortality are graphically illustrated in the two accompanying charts, I and V, one on page 447, and the other on page 470.

The steadiness of decline in both the male and female death-rates from diphtheria and croup in the United States registration area, during the last fifteen years, and the uniformly higher male death-rates, with the single exception of the year 1914 are two facts made clear in Table 23.

That the attack-rate of diphtheria and croup follows closely the mortality rate in its sex differences seems to be reasonably certain from the Providence, R. I., statistics.* These, quite exceptionally valuable data, have been

*See Chart I, p. 447.

CHART V.

Mortality from Diphtheria and Croup

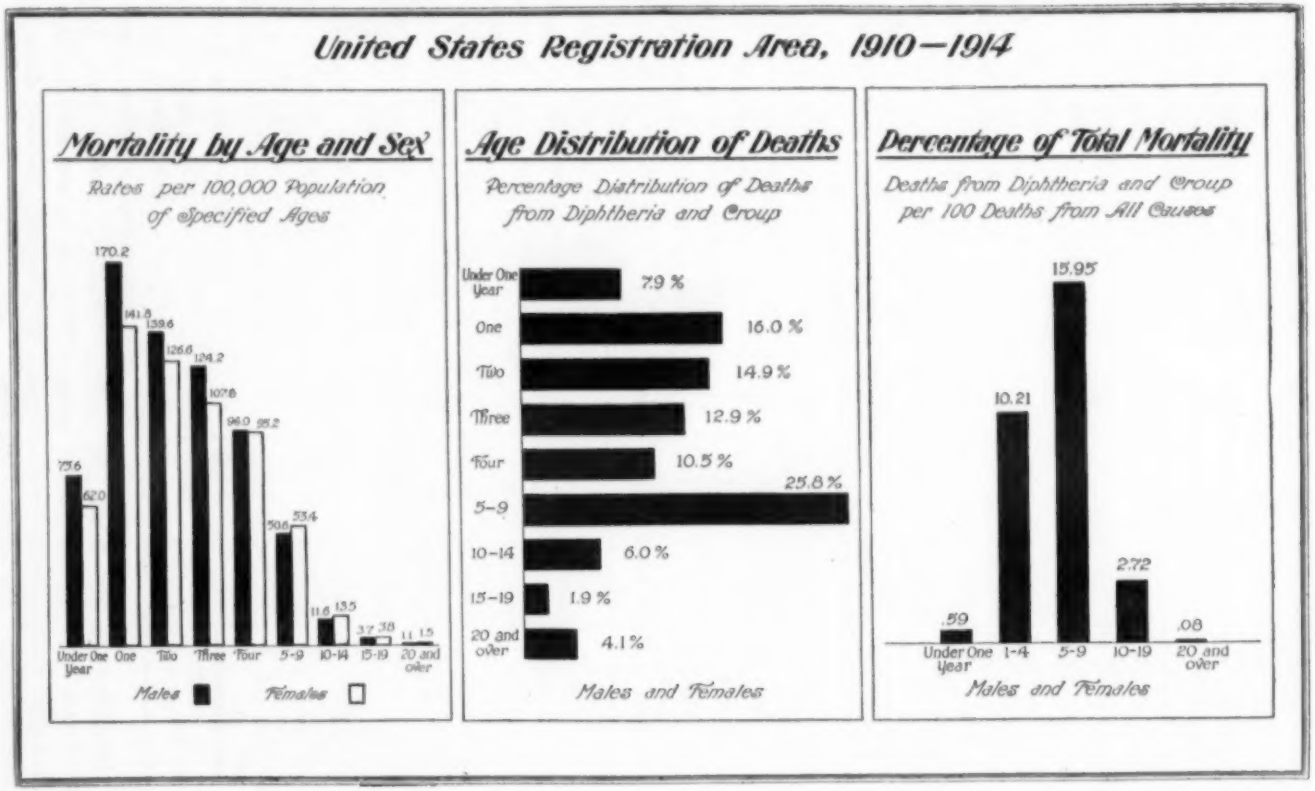


TABLE 23. MORTALITY FROM DIPHTHERIA AND CROUP, WITH DISTINCTION OF SEX, UNITED STATES REGISTRATION AREA, 1900–1914.

Year.	Males.			Females..		
	Population.	Deaths.	Rate per 100,000 population.	Population.	Deaths.	Rate per 100,000 population.
1900	15,415,757	6,749	43.8	15,378,516	6,565	42.7
1901	15,742,434	5,346	34.0	15,628,518	5,321	14.0
1902	16,111,848	5,067	31.4	15,917,967	4,792	30.1
1903	16,489,113	5,310	32.2	16,211,970	5,053	31.2
1904	16,856,270	4,827	28.6	16,492,867	4,617	28.0
1900–04	80,615,422	27,299	33.9	79,629,838	26,348	33.1
1905	17,274,352	4,041	23.4	16,820,253	3,998	23.8
1906	21,322,133	5,624	26.4	20,661,286	5,169	25.0
1907	21,899,144	5,329	24.3	21,117,846	4,825	22.8
1908	23,876,529	5,251	22.0	22,913,384	4,801	21.0
1909	26,020,431	5,382	20.7	24,850,087	4,976	20.0
1905–09	110,392,589	25,627	23.2	106,362,856	23,769	22.3
1910	27,606,526	5,971	21.6	26,237,370	5,550	21.2
1911	30,463,411	5,874	19.0	28,812,566	5,390	18.7
1912	31,128,193	5,684	18.3	29,298,940	5,329	18.2
1913	32,607,069	6,213	19.1	30,691,649	5,707	18.6
1914	33,984,487	6,021	17.7	32,004,808	5,765	18.0
1910–14	155,789,686	29,673	19.0	147,045,333	27,741	18.9
1900–14	346,797,697	82,599	23.8	333,038,027	77,858	23.4

compiled for an eighteen-year period, 1896 to 1913, and are presented in Table 24.

The higher diphtheria attack-rate of exposed females as compared with exposed males is quite pronounced at all ages above five years and the higher attack-rate of males is equally pronounced in the first four years of life.

Age.

William Farr as early as 1861 wrote as follows: "In its age incidence diphtheria is very different from croup, which attacks chiefly children of one, two and three years of age, the boys dying in greater numbers than the girls."* In 1894 Thorne stated as follows: "Age affects the deaths in a very remarkable manner, as is shown by the Registrar-General's reports. Taking the proportion of deaths per 100,000, the deaths at different ages under 10, vary from 34 to 70. The moment you pass 15 years of age a change comes, and after 25 years, instead of rates reaching 43, 70, 64 and 70, respectively, they drop to 2, 2, 1, 2

* Registrar-General's Report, Vol. XIV (1861), p. 217.

TABLE 24. DIPHTHERIA ATTACK-RATE, BY AGE AND SEX, PROVIDENCE, R. I., 1896–1913.—PRIMARY CASES DEVELOPING IN FAMILIES WHERE DIPHTHERIA BACILLI WERE FOUND.

Ages.	Males.			Females.		
	Number exposed, including cases.	number of cases.	Attack-rate per 100 exposed.	Number exposed, including cases.	Number of cases.	Attack-rate per 100 exposed.
Under 1 year....	559	63	11.3	503	47	9.3
1 year.....	533	157	29.5	528	129	24.4
2 years.....	643	256	39.8	577	200	34.7
3 years.....	653	237	36.3	643	208	32.3
4 years.....	713	262	36.7	711	263	37.0
5–9 years.....	3,112	1,071	34.4	3,217	1,210	37.6
10–14 years	2,064	400	19.4	1,984	480	24.2
15–19 years	1,144	127	11.1	1,132	165	14.6
20 years and over	7,283	249	3.4	8,172	416	5.1
Total.....	16,704	2,822	16.9	17,467	3,118	17.9

and so on. Indeed after 25 years of age, diphtheria is a disease which is very little fatal in this country (England). And, more than this, the deaths from diphtheria over that age occur to an important extent among those who are brought into contact with the sick, such as nurses, mothers, and medical men. The greatest age incidence of the disease is between 3 and 10 years of age."*

The mortality statistics of diphtheria and croup have already been presented at some length, with particular reference to their correlation with the sex factor. In the statistics already presented it is clear that in this country as in England and Wales and elsewhere the death-rate from diphtheria is highest at ages 1 to 4 years. The rate drops rapidly after the fifth year of life and it remains low throughout the adult period of life. These facts are most clearly brought out in Table 22, giving the death-rates for the registration area of the United States, by Sex and Age, p. 469.

In Table 25 the attack-rates, by ages of persons known to have been exposed to diphtheria are compared with similar attack-rates of persons known to have been exposed to scarlet fever in the city of Providence, R. I.

The table shows quite a striking similarity in the attack rates of the two diseases at ages under 3 years, then the scarlet fever rates remain higher up to 20 years, at least, when the diphtheria death-rate gains quite a marked ascendency.

The comparatively low mortality from diphtheria in the first year of life has been noted by many writers from

* The Etiology, Spread and Prevention of Diphtheria, by R. Thorne Thorne, *Journal Sanitary Institute*, April, 1894.

TABLE 25. ATTACK-RATES, BY AGE, PERSONS EXPOSED TO DIPHTHERIA AND SCARLET FEVER, PROVIDENCE, R. I., 1889–1913.

Ages.	Diphtheria.			Scarlet Fever.		
	Number exposed.	Number of cases.	Percentage attacked.	Number exposed.	Number cases.	Percentage attacked.
Under 1 year....	1,612	263	16.3	1,560	283	18.1
1 year.....	1,533	657	42.9	1,421	579	40.7
2 years.....	1,810	991	54.8	1,754	970	55.3
3 years.....	1,901	1,055	55.5	1,949	1,229	63.1
4 years.....	1,952	1,095	56.1	1,859	1,240	66.7
5–9 years.....	8,751	4,323	49.4	8,995	5,619	62.5
10–14 years	5,543	1,725	31.1	5,009	2,047	40.9
15–19 years	3,235	593	18.3	2,761	625	22.6
20 years and over	21,882	1,609	7.4	18,219	833	4.6
Total.....	28,219	12,311	25.5	43,527	13,425	30.8

Bretonneau * in 1859 to Rolleston † in 1916. In Rolleston's practice in London, Eng., out of 2,600 consecutive cases of diphtheria only 20, or less than 1 per cent. were in the first year of life. In the Metropolitan Asylums Board's Hospitals, London, the percentage of cases in the first year of life has varied from 1.5 to 2.8 during the period 1888 to 1914. In Providence, R. I., the attack-rate of exposed persons, aged under 1 year, averaged only 16.3 per cent. against an attack rate of 42.9 per cent. in the second year of life. There have been many theories to account for this apparent immunity but there are exceptions to all of them. From analogy with other diseases of infancy and from statistics of breast-fed infants as compared with the artificially fed, the weight of evidence would seem to favor the theory that diphtheria immunity is favored by breast feeding. A special investigation in Boston revealed the fact that out of 20 deaths of infants from diphtheria all but three were bottle fed. The other three were all Italian children.‡

In the following table the distribution by age of the total deaths from diphtheria and croup in the registration area of the United States during the three years, 1910 to 1912, is compared with the similar distribution of the scarlet fever deaths.

It is shown that nearly eight per cent. of all the deaths from diphtheria occurred at ages under one year, against about five per cent. for scarlet fever. It must be remembered, however, that the case fatality of diphtheria is quite exceptionally high at all the early ages and particularly so at ages under one year. In London, during the five years, 1910 to 1914, the case

* Memoirs on Diphtheria, New Sydenham Society, 1859.

† Diphtheria in the First Year of Life, *American Journal of Diseases of Children*, July, 1916.

‡ Trans. 15th International Congress on Hygiene and Demography, Vol. VI, p. 187.

TABLE 26. COMPARATIVE MORTALITY FROM DIPHTHERIA AND CROUP AND SCARLET FEVER, BY AGE AT DEATH, REGISTRATION AREA, U. S., 1910–1912.

Ages at death.	Diphtheria and croup.		Scarlet fever.	
	Number of deaths.	Distribution on basis of 1,000 deaths, all ages.	Number of deaths.	Distribution on basis of 1,000 deaths, all ages.
Less than 1 day	3	0.1	3	0.2
1 day	8	0.2	3	0.2
2 days	12	0.4	4	0.3
3 to 6 days	36	1.1	4	0.3
Less than 1 week	59	1.8	14	0.9
1 week	66	2.0	18	1.2
2 weeks	70	2.1	13	0.8
3 weeks but less than 1 month	58	1.7	14	0.9
Less than 1 month	253	7.5	59	3.8
1 month	167	5.0	20	1.3
2 months	131	3.9	24	1.5
3 to 5 months	403	12.0	115	7.4
6 to 8 months	644	19.1	209	13.5
9 to 11 months	1,045	31.0	335	21.6
Under 1 year	2,643	78.4	762	49.1
1 year	5,438	161.4	1,725	111.1
2 years	5,069	150.4	2,236	144.0
3 years	4,469	132.6	2,139	137.7
4 years	3,477	103.2	1,622	104.4
5 to 9 years	8,549	253.7	4,353	280.3
10 to 19 years	2,671	79.3	1,756	113.1
20 years and over	1,378	40.8	937	60.3
Total, known ages	33,694	1,000.0	15,530	1,000.0

fatality percentage of males aged under one year was 23.9 and for females 28.5; in the second year of life the percentages were, males, 19.6, and females, 20.8; in the third year of life the case fatality had dropped to 11.3 per cent. for males and to 12.3 per cent. for females. With advancing age the case fatality rates decline rapidly in diphtheria just as this is the case in measles, whooping-cough and scarlet fever.

The principal facts relating to age as a factor in diphtheria are set forth graphically in Charts I and III, pages 447 and 470.

Complicating Diseases.

There are so many interesting points in diphtheria mortality and morbidity that it would be hopeless to attempt to deal with all of them, even briefly, in a single paper. The question of complicating diseases is too important, however, to be entirely left out of ac-

count. Perhaps this feature has been best recorded statistically in the annual reports of the Metropolitan Asylums Board, London. In the following table are presented exceptionally interesting data for 49,308 completed cases of diphtheria treated in the Metropolitan Asylums Hospitals during the ten-year period, 1905 to 1914. Albuminuria was a complicating factor in one-fourth of the cases and paralysis in one-eighth of the cases. Other comparatively frequent complications were otitis, scarlet fever, adenitis, bronchopneumonia, lobar pneumonia, measles, chickenpox, nephritis and whooping-cough.

In the Industrial mortality experience of the Prudential Insurance Company of America during the two years 1914 and 1915 the secondary complications were as exhibited in Table 28, p. 476.

Heart diseases are shown to have been by far the most important, numerically, of the secondary complications, totalling 296. Respiratory diseases were complicating factors in 277 cases; scarlet fever in 121 cases; urinary diseases in 98 cases; and measles in 51 cases.

Diphtheria was itself a secondary complicating cause in only six cases in this same experience. In four of these cases typhoid fever was the primary cause and in two cancer was the primary cause.

TABLE 27. INCIDENCE OF COMPLICATIONS AMONGST COMPLETED DIPHTHERIA CASES, 1905–1914. METROPOLITAN ASYLUMS BOARD, LONDON, ENG.

Complications.	Number.	Number per 1,000 diphtheria cases.
Albuminuria	12,369	250.9
Paralysis	6,135	124.4
Otitis	2,371	48.1
Scarlet fever	2,203	44.7
Adenitis*	1,658	33.6
Bronchopneumonia	593	12.0
Measles	436	8.8
Relapse of disease	419	8.5
Chickenpox	347	7.0
Nephritis	299	6.1
Pneumonia, lobar and unqualified	225	4.6
Whooping-cough	202	4.1
Rubella	106	2.2
Mastoid abscess	56	1.1
Mumps	36	0.7
Tonsilitis	11	0.2
Erysipelas	10	0.2
Jaundice	3	0.1
Tuberculosis	2	0.1
Bronchitis	1	0.0
Enteric fever	1	0.0
Influenza	1	0.0
Stomatitis	1	0.0
Total complications	27,485	557.4
Total completed cases	49,308	.....
*Adenitis	1,658	33.6
Suppurative adenitis of acute stage	176	3.6
Suppurative adenitis of convalescence	230	4.7
Simple adenitis of convalescence	1,252	25.3

General Conclusions.

Diphtheria as a cause of sickness is perhaps as prevalent today from the viewpoint of its world-wide distribution as it has ever been in the past. There is reason to believe that it is still spreading geographically and tending to become endemic in the more remote sections of the earth.

Antitoxin is the principal curative agent and its value will increase as the technique of its use is improved and its administration becomes more prompt and universal. There is much

TABLE 28. DIPHTHERIA MORTALITY, INDUSTRIAL MORTALITY EXPERIENCE, THE PRUDENTIAL INSURANCE COMPANY OF AMERICA, 1914–1915.—INCIDENCE OF SECONDARY COMPLICATIONS.

Diseases.	Total.	Under 5 years.	5–9 years.	10–19 years.	20 years and over.
Uncomplicated	2,834	1,406	1,081	261	86
Smallpox	1	1	..	..	..
Measles	51	40	9	2	..
Scarlet fever	121	62	38	15	6
Whooping-cough	12	9	2	..	1
Influenza	3	3	..	..	..
Dysentery	2	1	..	..	1
Erysipelas	1	..	..	..	1
Other epidemic diseases	1	..	1	..	..
Septicemia	19	6	11	2	..
Tuberculosis	3	..	..	1	2
Pott's disease	1	..	..	1	..
Acute rheumatism	2	..	2	..	..
Diabetes	1	..	..	..	1
Leukemia	1	..	..	1	..
Anemia	1	1	..	..	..
Other general diseases	6	2	3	..	1
Encephalitis	2	1	1	..	..
Meningitis	5	1	3	..	1
Cerebrospinal meningitis	2	2	..	..	..
Cerebral hemorrhage	1	1	..	..	..
Paralysis	18	8	8	1	1
Convulsions	5	3	2	..	..
Neuralgia-neuritis	4	2	1	1	..
Other nervous diseases	1	1	..	..	..
Diseases of ears	1	..	..	1	..
Pericarditis	2	2	..	..	..
Acute endocarditis	230	65	123	33	9
Organic heart diseases	62	17	23	13	9
Angina pectoris	2	..	1	1	..
Disease of arteries	1	1	..	..	..
Embolism	2	..	2	..	..
Disease of lymphatic system	3	2	1	..	..
Other circulatory diseases	5	3	1	1	..
Diseases of nasal fossae	1	..	1	..	..
Diseases of larynx	20	8	12	..	..
Acute bronchitis	8	6	2	..	..
Chronic bronchitis	2	..	1	1	..
Bronchopneumonia	170	133	30	7	..
Pneumonia	54	33	15	3	3
Pleurisy	2	..	..	1	1
Pulmonary congestion	19	9	5	3	2
Asthma	1	..	1	..	..
Diseases of mouth	2	2	..	..	..
Diseases of pharynx	25	7	10	7	1
Diseases of stomach	7	1	5	1	..
Diarrhoea-enteritis	20	10	6	2	2
Appendicitis	2	..	1	..	1
Hernia	1	..	1	..	..
Other Intestinal diseases	3	2	1	..	..
Liver diseases	1	1	..	..	..
Peritonitis	1	1	..	..	..
Acute nephritis	56	16	31	9	..
Bright's disease	40	10	22	6	2
Other kidney diseases	2	1	..	..	1
Diseases of uterus	1	..	..	1	..
Other accidents of labor	1	..	..	..	1
Acute abscesses	4	..	1	2	1
Diseases of bones	2	..	1	1	..
Senility	1	..	..	..	1
Ill-defined organic diseases	2	2	..	..	..
Sudden death	1	..	1	..	..
Not specified or ill-defined	65	17	30	14	4
Totals	3,920	1,899	1,490	392	139

evidence that if quicker positive diagnosis can be had antitoxin will become a much more powerful curative weapon than it now is in most of the cities, towns and rural areas of the world.

The specific cause of diphtheria being well known and a curative agent having been discovered it now remains to find some practical means of removing or effectually opposing the underlying conditions favorable to the spread of the disease. The Schick test has made it possible to readily detect persons susceptible to the Klebs-Loeffler bacillus and the temporary immunization of exposed persons by preventive dosage with antitoxin is probably the most important recent development in the scientific efforts to prevent the spread of diphtheria.

Finally, however, it must be admitted that many of the possibly very important underlying conditions favorable to the development and spread of diphtheria are not well understood, if known at all. The comparative importance of temperature, rainfall, altitude, drainage, etc., the possible variations in the virulence of the diphtheria germ under varying conditions of time and place are among the factors which require more extensive research than has thus far been possible. In these inquiries the statistical method is likely to prove a helpful supplement to the methods and work of the bacteriologist and pathologist.

THE PRESENT STATUS OF THE SCHICK TEST.

In an article appearing in the April *Health News* of the New York State Department of Health, entitled "The Present Status of the Schick Test and Active Immunization with Diphtheria Toxin-Antitoxin," by Dr. Abraham Zingher, the author derives the following summary and conclusions:

"1. The testing of children with the Schick reaction on a large scale in the homes, schools and institutions can be readily accomplished, and a permanent record should be kept of the results. From the results which we have obtained, we feel certain that the majority of children, who have passed their second year of life and show a negative reaction, are protected for years and probably for life.

"2. The data that we thus obtain will represent valuable facts, both for the individual and the community.

"3. For the individual the assurance of an immunity to diphtheria will be of great value. If susceptible, he can be actively immunized with three injections of toxin-antitoxin. Schick retests should subsequently be made to determine the success of the protection obtained.

"4. For the community, with an increasing knowledge of the number of permanent immunes, and the selection and immunization of the susceptible ones, we may finally be able to control a disease which continues to be one of the big issues of preventive medicine. The failure so far has been made especially evident by our attempts to deal with the problem of the bacillus carrier. It will probably not be by the elimination of the bacillus carriers, but rather by the active and possibly permanent immunization of the susceptible individuals in a community that we will prevent fresh cases of infection and, to some extent at least, the development of new foci for the dissemination of virulent diphtheria bacilli."

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THE INSTITUTE OF HEALTH OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

During the past few years the American Public Health Association has endeavored in various ways to increase its effectiveness as a force to bring about improved health conditions. Its major effort has been directed towards the publication of the American Journal of Public Health. This Journal, now in its seventh volume, has been able by dint of much work and generous gifts by members of the Association and a few non-members to firmly establish itself. It has now become indispensable to the thoughtful health worker in every branch of the subject. Many members of the Association and subscribers to the Journal have been kind enough to express their appreciation and approval, and this approbation has acted as an added stimulus to the management for further improvement.

The annual meetings of the Association have also increased in effectiveness and far reaching importance; larger attendances have been recorded, and great interest and enthusiasm evinced.

Lack of funds has prevented the development of additional work on the part of the Association, although for a long time many of the members have felt that the Association should take a greater and more direct part in the public health activities of the countries represented in it.

A Health Information Bureau and a Health Employment Bureau have recently been established, and although these activities have been limited from necessity, the office has come to realize that both of these new services are actually fulfilling a definite need, and that they should be developed to perform greater usefulness.

The Executive Committee of the Association during the past two years, and earlier the Committee of Seven, have endeavored to raise sufficient funds to enable the Association to undertake constructive work in new fields where assistance was needed. And so it is with particular pleasure that the Executive Committee of the American Public Health Association is able to report that the Metropolitan Life Insurance Company has expressed its willingness to spend $25,000 in publish-

ing pamphlets and forms prepared by the Association along lines which justify the company in relation to the health of its policy holders.

It is planned that this money shall be budgetted on a two year basis, and the Executive Committee, after careful deliberation, has decided to create a special bureau to be known as the Institute of Health of the American Public Health Association. This institute is to be a Bureau of Information and Assistance, and will take over the existing information and employment bureaus and develop them. In addition, the new Institute is to create and develop a special service, particularly intended for the benefit of the health authorities of the smaller communities. It is planned that a regular educational service be established, which shall issue at regular intervals bulletins of a strictly practical nature, peculiarly adapted for the untrained and more or less inexperienced health officer, sanitary inspector, and community health worker.

In addition to this regular service, the Institute will be prepared to assist and advise local health authorities on special questions and problems dealing with health administration and public health practice; to supply lecturers and general propaganda where possible, in order to aid in the creation of a public conscience in connection with the establishment of needed health reform.

It is planned ultimately to develop regular correspondence courses particularly for the more subordinate officers of the modern health department, or for men and women who are planning to enter the health field. It seems most reasonable to presume that from such a beginning there may arise a process of examination and certification, similar to that practised by the Royal Sanitary Institute of England. Such certification, while entirely of an unofficial character, should rapidly demonstrate its usefulness and should become a desideratum on the part of ambitious and interested sanitary inspectors.

It is therefore with the utmost gratification that the Executive Committee is able to announce the advent of the American Public Health Association into greater fields of activity and usefulness, and to thus establish a more direct working basis for the extention of its influence in the great service of public health activity.

THE SANITARIAN AND WAR.

Ever since it was officially recognized that a state of war existed between the German Empire and the United States, the patriotic men and women of America have been asking themselves what they could do toward the successful prosecution of the war. Many have found this an extremely difficult question to answer. We have not entered the war in anger but in defense of principles which we believe to be as just as they are universal in their application. Thus far, so far as the United States is concerned, the war has existed entirely on paper, and we have not been stimulated by the call which comes from danger or from anger. Modern war is peculiar in that it is carried on not only by those individuals who compose the destructive combatant forces but also by the industrial constructive combatants who perhaps never hear a gun fired or see a wounded man. In other words we know that more than ever before in the history of the world war is fought with brains and stamina and is not confined to the firing line alone. Therefore the educated American feels that there is need for his services, but at the outset he is confronted with the necessity of choosing in which of the classes of combatants he can render the most efficient aid. We, as sanitarians, must face this question and answer it, each for himself.

In the last analysis, the thing which will win this war, so far as the United States is concerned, is the health of the American people. Our courage, our virility, our staying power, our ability to produce foods and other munitions of

war, both for ourselves and for our allies, is absolutely dependent upon this. There is no military necessity which is more important than the maintenance of a healthy people. War but serves to increase the importance of health and doubles the responsibility which is placed upon us as the health wardens of the general public. Aside from this, the collection and movement of large bodies of men, which, in the beginning at least, will consist largely of raw, irresponsible levies, the increased speed and pressure which will be demanded of labor, the relative scarcity and consequent rise in prices of the necessities of life, all will but serve to make the sanitary problem more difficult. Already, a considerable number of medical men engaged in the practice of sanitation have been commissioned. Large numbers of sanitary engineers have taken service in the engineer corps. This means that an additional burden has already been thrown on the remaining sanitarians. This requires increased vigilance of those who have not entered the strictly military services, and but serves to accentuate the importance of the sanitarian who stays at home.

That this war may bring forth hitherto undreamed of sanitary problems is entirely probable. Many of these problems will have a direct bearing upon the health of armed troops; others will be related to the health of the industrial forces which must be maintained in order that the fighting man may be fed and at the same time spared the danger of communicable disease from the civil community. When these special problems arise, trained specialists will be required to solve them. The sanitation of food supplies alone may require the combined services of several laboratories. The problems of alcohol and the venereal diseases, the control of tuberculosis, typhoid, and particularly measles, may, in certain instances, tax very heavily civilian health agencies.

No practising sanitarian who, by reason of age or physical incapacity, is obliged to stay at home, need feel himself a "slacker" if he discharges thoroughly the duties of his position. There is work enough to go around with the Army, the Navy, and the Public Health Service. Until we are called to the colors, however, let us bend our every effort to the promotion of the public health, in the full realization of its vital necessity at the present time. The destructive side of war must of necessity go forward, but in the excitement of military preparation let us not forget that it is health and the other constructive forces of the body politic which will win this war.

Herbert W. Conn, Ph. D.

Born January 10, 1859. Died April 18, 1917.

Prof. Herbert W. Conn of Middletown, Conn., died April 18, 1917. Doctor Conn was Professor of Biology, Wesleyan University, and in this connection organized the State Board of Health Laboratory in 1905 and continued as its director until the time of his death. In March, 1911, he was appointed by the New York Milk Committee as a member of the National Commission on Milk Standards and since then has given freely of his time and talents to the work of this commission. His interest in milk as a scientist was exceeded only by his humanitarian interest in standardizing milk to prevent unnecessary loss of infant life.

He was a director and a member of the Executive Committee of the American Public Health Association, and was affiliated with many other scientific organizations.

As a man of sterling character, as a pioneer health worker and as a scientist of national repute, we deeply mourn his loss.

U. S. ARMY METHODS OF DISPOSAL OF CAMP REFUSE.

JAMES M. PHALEN,
Major, Medical Corps, United States Army.

IT WILL not be possible within the compass of this paper to indulge in any discussion of the many possible methods of camp refuse disposal. It will be the aim only to direct attention to a few procedures that have proven their value under certain conditions of camp life, and perhaps to mention a few others which might prove more satisfactory under different conditions. The subject naturally divides itself into the disposal of kitchen and camp area refuse, of manure and of human excreta and these items will be taken up in order.

KITCHEN REFUSE.

For a camp of anything but the shortest duration the destruction of kitchen refuse by burning is the only method to be considered. And to do this some form of a kitchen incinerator must be constructed. A description of the details of any of the many types of incinerator will not be attempted but only general principles of their construction given.

The first essential is an excavation in the ground quadrangular or oval about 6 feet by 3 and preferably as much as 4 feet deep. This is filled loosely with large stones, broken brick or other material which will conserve heat. The dirt taken from the pit is banked along the sides to the height of about a foot and this sloping banking is paved with stones, the ends being left without banking in order to increase draught. Upon this incinerator a wood fire is kept constantly burning and onto the heated stones is dumped all the refuse from the kitchen. By pouring the liquid refuse slowly and evenly over the heated stones, a great part will be taken care of by rapid evaporation and the remainder ordinarily by seepage into the ground. With a relatively impervious soil it is necessary to furnish the incinerator with evaporating pans for the liquid. Solid kitchen refuse is readily dried and consumed upon this incinerator.

Such an incinerator as described above is furnished for each company kitchen and not only is consumed thereon all kitchen wastes from the organization, but also all camp refuse from the camp area of the company. This includes the sweepings of the tents and the litter which has accumulated in the company street. Police of the camp begins at the back line and the police party work forward toward the kitchen line and the accumulated rubbish is thrown upon the incinerator to be consumed. The ultimate disposal of the refuse from the incinerators requires that there be selected immediately upon the establishment of the camp a convenient site for a refuse dump and that no dumping be permitted elsewhere. By putting a non-commissioned officer in charge of this dump with a couple of civilian laborers to keep it leveled off and to maintain a road across it, large quantities of such refuse can be dumped upon a small area. By this method

an average of thirty wagon loads a day for twenty months was dumped upon an area of practically one acre.

Manure Disposal.

The collection of manure from the picket lines should be practically continuous during the day. Beginning with the morning police when the bedding is removed and set aside to sun and dry and the night droppings swept up and carted away, attendants should be on duty on the picket lines to prevent accumulations of wet manure under the horses' feet. It is only necessary at the time that it be up in piles to facilitate drying. Daily removal of manure from the vicinity of the picket lines is sufficiently often.

The satisfactory disposal of manure is always difficult and likely to be expensive. Much depends upon the amount to be disposed of. It may be confidently stated that manure will furnish flies to a camp from any distance to which it may be economically hauled by wagon, if it is not further treated. It would appear to be highly desirable that arrangements be made with associations of nearby farmers so that the manure could be placed upon flat cars conveniently set for the purpose to be transported where needed for fertilizing purposes. In the absence of such an arrangement resort must be had to burning. The use of chemicals such as borax or iron sulphate, while entirely satisfactory in the prevention of fly breeding in small quantities of manure, would be impracticable here. The following method has proven satisfactory to the writer in a camp containing about 4,500 animals and which furnished about 100 wagon loads of manure daily:

A site for the dump was marked off, 1,000 yards long by about 80 yards wide. The manure was dumped in winrows running across this area. These winrows were made by dumping the manure from the tail of the wagon as it was gradually moved across the dumping area. The winrows were about 18 inches high in the middle and of the width between the wagon wheels. Practically all of the manure was hauled out early in the forenoon and much of it was quite wet. It was necessary to let it stand for a few hours so that the surface at least would be dry. On this dump six civilian laborers were employed. They sprinkled the windward side of the winrows with crude oil and set them afire. Thereafter they were occupied in turning the manure with forks in order to keep the fires burning and to bring the more wet part to the surface for the action of the sun. In the burning of this amount of manure from three to five barrels of crude oil a day were required, depending upon the amount of wind blowing.

This method of disposal was satisfactory except during prolonged wet weather when burning was rendered impossible. Such periods were invariably followed by a plague of flies a week or ten days later.

A side line of this dump was the disposal of dead horses and mules many of which would be furnished by a camp of this size. Near the manure dump a hole about 15 feet long by 10 wide was dug to a depth of about 4 feet. Orders were given by the camp commander

that dead animals taken to the dump for disposal should be accompanied by half a cord of wood. This wood piled around and on top of the horse with a couple of buckets of crude oil poured over it would furnish fuel for the speedy cremation of the animal. A score or more of animals can be burned in such a pit before there is any necessity of removing the ashes and remaining bones. It is an advantage to burn a number of animals in the same pit as each succeeding cremation aids in the disintegration of the remaining parts of those previously burned.

Disposal of Human Excreta.

No one will question the advantage, where such is to be obtained, of having a sewerage system installed in camp and the excreta disposed of by water carriage. Unhappily this is rarely practicable. Excreta incinerators had a short vogue but they have had their day. They had disadvantages not to be discussed here. The experience of the Maneuver Division at San Antonio in 1911 supplemented by that of the Second Division Camp at Texas City in 1913–14 has firmly fixed the position of the deep pit latrine as the method of widest general application to camp conditions. Simply stated this is only a deep pit with a fly tight box, with proper care given to its maintenance. The pit is usually dug about 8 feet deep if possible, 18 inches to 2 feet wide and should be 18 or 20 feet long for a company latrine. The box should be constructed of seasoned tongue and groove or shiplap material so that no cracks will result to permit flies or even light to enter the pit. It should have two running feet for each hole, with an additional foot at each end. Thus a company box should be 18 feet long and furnished with 8 holes. The covers should close the holes tightly, be constructed so that they cannot warp and the back of the box should be furnished with a rail so set that the cover could not remain open when the hole was unoccupied. Around the edge of the pit is placed a frame of planking upon which the box is set. As the box must be removed for a daily burning of the pit, the box must be light enough to be turned back by no more than two men. In front of each hole should be nailed to the upper angle a piece of tin, 8 x 12 inches, shaped into a gutter and so placed that it will divert the urine back so as to clear the anterior wall of the pit. The latrine should be not only enclosed at the side but it should be well roofed. This adds much to the comfort of the occupants and prevents flooding and caving of the pit during heavy rains. As a further protection the inclosure should be well ditched at a distance of a foot from the walls and the roof should extend sufficiently far beyond the walls to deliver storm water into these ditches.

The principal item in the care of the latrine is a daily burning out. For this purpose the box is turned back and a layer of hay or straw is thrown into the pit which is sprinkled with crude oil and set afire. The usual allowance for this purpose is one gallon of oil and 14 pounds of hay per day for each latrine. After the hay is consumed and the fire has burned out

the box is restored to its place and made tight again. It is usually necessary to make the joint between the box and the base tight by banking up with a little earth.

It is evident that the object of burning out the latrine pit is not the incineration of its contents. Certainly such a result is not obtained. What is accomplished is the production of a charred layer over the excreta which renders it unattractive to flies. Fly larvæ near the surface are probably killed. To accomplish the object of rendering the latrine pit unattractive to flies a new method was given a tryout on the Mexican border last summer. I am not sure to whom is due the credit for having originated the idea. It first came to my notice from a militia medical officer of New York. The method consists in spraying the interior of the pit daily with a suspension of lamp black in coal oil. It has the advantage that it can be applied through a hole thus avoiding the necessity of removing the box. After a limited experience with the method I am of the opinion that it has decided value and I understand that a board which investigated its merits was of the opinion that it was more effective than the older method of burning.

It is necessary to make provision for the collection and disposal of night urine, this to prevent the contamination of the ground of the company streets. For this purpose there are placed in each company street as accessible as possible to the greatest number, two galvanized iron cans, whitewashed to render them the more conspicuous and usually further to be easily located by the presence of a lighted lantern. The contents of these cans are emptied each morning into the latrine pit, the cans are burned out with the aid of a handful of hay and a dash of crude oil, a layer of whitewash is applied to the outside and it is turned bottom up until again needed.

It is not to be understood that these procedures inaugurate themselves or that they ever become automatic in their action. The methods to be followed are specified in a general way in the Sanitary Order, one of the very first general orders issued after the establishment of a camp or even when such an establishment is contemplated. With this general order as a basis, regimental commanders and others issue orders in the necessary detail. And after the provisions of the sanitary order have been put into operation it devolves upon the sanitary inspector to keep them in efficient operation. There is too much ignorance and indifference to be overcome and too much willful disobedience to be combated for the vigilance of the sanitary inspectors to be relaxed no matter how long the camp may be in existence or how sanitary its appearance may be at a given inspection. With the application of such sanitary measures as I have outlined, supplemented by competent inspection, and with good shelter and intelligent preparation of the food ration provided, there is no reason why troops may not be kept for indefinite periods in camp with sick rates as low as those of troops houses in the most modern of barracks.

EXAMINATION OF RECRUITS FOR THE ARMY AND MILITIA.

HARRY D. ORR,
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IN THE examination of recruits for the regular army and militia the War Department has issued concise and detailed instructions varying in many important details as indicated by the work of the branch of the service in question. Next to the care of the soldier in the field, the most important factor in the attainment of military efficiency, is the proper selection of the recruit. None but the robust and able-bodied must be enlisted because only these can stand the exposure and hardships to which troops are subjected and can acquire the endurance to fatigue and resistance to disease which go to make up the efficient soldier. Delicate or immature young men or those suffering from slight or chronic ailments are easily exhausted and acquire disease readily thereby weakening the ranks they had intended to strengthen and, falling by the wayside when they are most needed, fill the ambulances and hospitals reserved for the wounded and later become applicants for pensions from the government which they have never effectively served. The best possible care will never make effective soldiers of these men who in addition to their own ineffectiveness frequently further deplete the military forces by making it necessary to assign able-bodied men to care for them. For this reason the crime of the physically deficient is doubled.

The percentage of physically unfit from the standpoint of military service is appalling. The verdict of the recruiting medical officer should be a shock to the nation. Ordinarily two to three out of every four applicants for the regular army are rejected as physically unfit. The young man who has dissipated his energies and undermined his health has sinned against his citizenship to an extent for which his atrophic manhood can never atone.

"Applicants for first enlistment must be between the ages of 18 and 35 years, of good character and temperate habits, able-bodied and free from disease, and must be able to speak, read and write the English language." Applicants may be required to satisfy the recruiting officer regarding age and character and should be prepared to furnish the necessary evidence.

While the upper age limit is 35 it is seldom in the interest of the service to enlist men over 30 and experience has shown that under 20 soldiers do not stand well the hardships and fatigue of a campaign. We reach our own greatest physical development between 25 and 30. The so-called veterans of Napoleon's army were from 26 to 28 years and "The Old Guard" was composed of men 28 to 29.

Much is written and said about emptying our jails and reformatories and sending these men to the trenches. As a matter of fact men who have served reformatory or jail sentences will not be accepted. Even petty offenders in civil offenses are not regarded with favor. Only clean,

healthy fellows with good records are wanted. The man who does not live up to the obligations of his citizenship in his own community is not fitted to serve the nation. Serving one's country is not a form of punishment but is a privilege of the highest order and only those whose records are clear and whose good citizenship has been proven in ordinary times should be chosen for this supreme test of the nation's manhood.

"For infantry, coast artillery, and engineers, the height must be not less than 5 feet 4 inches and weight not more than 190 pounds.

"For cavalry the height must be not less than 5 feet 4 inches and not more than 5 feet 10 inches and weight not to exceed 165 pounds.

"For field artillery the height must be not less than 5 feet 4 inches and not more than 6 feet, and weight not more than 190 pounds. For the mountain batteries the height must be not less than 5 feet 8 inches.

"A variation not exceeding a fraction of an inch above the maximum height given for cavalry and field artillery is permissible if the applicant is in good health and is in other respects desirable as a recruit.

"The minimum weight for all arms of the service is 128 pounds subject to certain variations below that standard but in no case will an applicant whose weight falls below 120 pounds be accepted without special authority from the adjutant general of the army."

The minimum height in our army is 64 inches while it is considerably lower in some of the armies abroad. In a well proportioned subject strength and staying qualities increase with the height but a maximum limit is soon reached. Very tall men, over six feet, are objectionable because usually the heart and lung power and muscular energy are not increased in proportion to their height, and in addition tall men require more food, more clothing and offer a larger target to the enemy.

Weight is of the greatest importance and considered in connection with the height is a valuable indication of the development of muscles and organs.

Respiratory capacity as indicated by chest mobility is of great importance. An expansion of less than 2 inches is unfavorable. Generally speaking the chest measure at expiration should never be less than 32 inches and should be at least one half the height in inches.

Modern war and the handling of present day weapons make a high degree of intelligence necessary. The recruit of today must be able to think for himself and have a very clear conception of his duties.

The consequences of intemperance in the use of stimulants or narcotics are so great that applicants whose habits in this respect are under suspicion should be rejected. When these matters are in doubt, it is better to reject, for the business of defending and upholding the flag is most important and serious and must not be delegated to those whose physical, mental or moral fitness is in question.

Visual requirements for the line of the army and signal corps are 20/40 for the right eye and 20/100 for the left eye provided that no organic disease exists in either eye. Recruits

may be accepted for the line of the army when unable with the right eye to read correctly all of the letters on the 20/40 line provided that they are able to read some of the letters on the 20/30 line. For the ordnance department and for the hospital corps 20/70 in each eye correctible to 20/40 with glasses provided that no organic disease exists in either eye. Color blindness is a bar for applicants of the signal corps.

In the matter of hearing the applicant should be able to hear the whispered voice at 20 feet with either ear. Deafness in either ear rejects although a mild degree in one ear may be overlooked. A discharging ear disqualifies.

"Unless an applicant has at least four serviceable double (bicuspid or molar) teeth, two above and two below, and so opposed as to serve the purpose of mastication, he should be rejected."

Deformities of the mouth interfering with mastication or speech, or enlargement of the tonsils sufficient to interfere with the voice or swallowing, disqualify.

Extensive goitre or of the ophthalmic type or great enlargement of the cervical glands are causes for rejection.

Deformities of the chest which diminish the respiratory function or which show disfigurement when the applicant is dressed, as well as poorly united fractures of the ribs or clavicle, reject.

Chronic bronchitis, pneumonia, pulmonary emphysema, asthma, chronic pleurisy and pulmonary tuberculosis disqualify.

Organic heart murmurs, that is, those accompanied by secondary physical changes, pronounced increase in the pulse rate, or marked irregularity always disqualify.

Any kind of hernia, chronic appendicitis or dyspepsia, gastric ulcer, chronic diarrhœa, or dysentery, and enlargement of the liver or spleen, are cause for rejection.

Hemorrhoids sufficient to produce symptoms, fistula, or marked varicose veins disqualify.

Syphilis in all stages, venereal ulcerations and all forms of gonorrhœa promptly and positively reject.

Varicocele, unless painful or very large, and small hydrocele do not disqualify.

All diseases of the bladder and kidneys and some defects of the urinary organs disqualify.

Total loss of either thumb, loss of any finger except the little finger of either hand, loss of more than one phalanx of the right index finger as well as loss of the terminal or middle phalanges of any two fingers on the same hand disqualify.

Marked curvature of the spine, dislocations or fractures, with incomplete restoration of function, anklyosis of joints or chronic bone inflammations are disqualifying.

Marked knock-knee, excessive bow-leg, flat-foot accompanied by symptoms, loss of the great toe or any two toes on one foot, marked hammer-toe, painful bunion, painful corns, particularly on the sole of the foot, web-toes, club feet, ingrown toe nails, "stinking" feet, and severe "sweaty" feet are disqualifying.

For certain departments special requirements are necessary, for in-

stance, in the aviation service, the most exacting tests are made of sight, hearing and nervous system. In picturing to the reader the acceptable candidate for the various branches of army service, a most excellent characterization by Major F. T. Woodbury, Medical Corps, U. S. A., cannot be improved upon.

"The infantryman must have well-formed, well-arched, elastic and strong feet. He must be well muscled and supple, neither adipose nor lean. He must have excellent heart and lungs, in a capacious chest, to supply him in his exertions; a good frame to carry his pack, a good eye to sight his rifle, a good ear to hear the enemy patrol, good teeth to chew, and good digestion to assimilate his plain but nourishing ration. He must be intelligent and have the stamina of manhood in its prime, to bear with triumphant fortitude the hardships of service, neither inclining to the tenderness of youth, nor yet to the submission of age. He must not be so tall as to be a burden to himself, or so short as to be unable to bear his portion of the company duties.

"The cavalryman need not have the frame and musculature of the infantryman, nor be so tall or so heavy, nor does he need such perfect feet and legs. His horse carries him and his pack. He needs suppleness of waist and strength of arm. While he may fight in mounted charges, he usually fights on foot in positions consecutively distant, whither he rides, and in formations usually near where his horse is held. He needs a keen eye and ear for scouting and patrols and he may be of younger age than the infantryman, as his service calls for dash and reckless daring in swift action, which is ever the delight of youth.

"The field artilleryman combines the functions of the foot and mounted troops, according as to whether he serves with a mountain, horse, or light battery.

"The coast artilleryman leads a more sedentary life than the preceding. His duties are laborious, but they are performed amid surroundings and under circumstances akin to many vocations in civil life. He is not ordinarily exposed to the hardships of short rations, nor required to endure the rigors of inclement weather continuously, without sufficient shelter or dry clothing, nor is he required to undergo forced marches as a preliminary to personal combat with the foe. He must have a well-built frame, of good height and well muscled. He need not be so agile and except under certain circumstances, where men are selected for special duties he does not need keen vision nor hearing; indeed, if we have the latter, the concussion of big-gun firing will soon render him hard of hearing. He must not be a stripling nor yet so old as to be incapable of training himself to his special duties.

"The aviator requires excellent vision and hearing, a sound heart and lungs, resilient arteries, mental poise combined with supreme courage, to enable him to endure the great barometric and meteorologic changes in his flights and daring, to maneuver his plane and his guns amid the clouds, or drop bombs or act as an aerial scout, scanning the enemy's movements."

THE PRINCIPAL DEFECTS FOUND IN PERSONS EXAMINED FOR SERVICE IN THE UNITED STATES NAVY.

CHARLES A. COSTELLO,
Assistant Surgeon, Medical Reserve Corps, United States Navy.

AT THE present time when the United States is in the midst of a world conflict as an active participant and Congress is about to enact a bill which will call to the colors the youth of the country for the purpose of giving them an extensive military training for the future part our forces are to play in the trenches which comprise the battle lines of the old world, or upon the seas with our fleet, it has occurred to me that a brief résumé of the physical defects which are the chief causes of rejection, together with the reasons therefore, may be of some help to the physician in civil practice who will be called upon by the government to help in securing the right kind of men when this bill becomes a law and is put into force.

It is unnecessary for me to say that a large percentage of these recruits drawn from all the conditions and walks of life will be found unfit for active military service, and if our present standards are maintained, which they no doubt will be, fully 50 per cent. will be disqualified and turned back to civil life.

Malingerers and slackers will take every advantage of their small disabilities; and, unfortunately, will be aided by unscrupulous members of our own profession, in their efforts to shirk their responsibilities to their country. It is purely up to the medical examiner to determine whether a man is fitted for service or not, and, if in his judgment the recruit is qualified, he should be accepted and forced to do his bit, regardless of any outside pressure brought to bear. It is also his duty to advise those disqualified, who are willing to serve, the proper steps to be taken to fit themselves for such service.

The purpose of this paper is to present in the order of importance, the most prominent and frequent physical defects met with in the examination of men applying for enlistment in the Navy. The first and commonest of all these is defective vision. Fully 35 per cent. of the total number of rejections in the recruiting offices are due to this cause; and it is a surprising fact that the majority of these are men who were unaware of any abnormality in their eyes until they failed to read the eye card at the minimum distance required, viz.: 15 feet. Men, with vision less than 15/15, are not of any use in the Navy, as in this branch of military service, a man must have two good eyes, and be able to see without the aid of glasses; which, while they may be perfectly fitted, are

subject to accidents such as the breaking of a lens, fogging in a rain or mist, glare in the bright sunlight, etc. A ship and the lives of its crew depend entirely upon the eyes of the men; so it can readily be seen a visual mistake is a serious matter, and can only be avoided by the absolute maintenance of the standard required by the Navy regulations. Before leaving this subject, I wish to suggest that the vision test is the easiest, and also the means most frequently resorted to by those individuals who desire for selfish or other motives to be disqualified in the physical examination and in this way avoid doing their duty. The utmost care must be taken by the examiner to preclude the possibility of any imposition being practised on him, and if his suspicions are aroused, a thorough test by a competent oculist should be made before a man is finally disqualified.

The second cause of rejection, and one of the greatest importance in my opinion, is pes planus, or flat feet. This condition, I believe is in a way a mistermed defect. I think some distinction should be made between a physiological flat foot, the type of foot most frequently seen, and the foot in which the arch is broken down. Physiological flat feet are characteristic of some races, especially those who do not wear shoes and are commonly seen in the white race as well. They seldom cause any trouble, and as far as the individual is concerned, he probably never is aware his feet are different from other men's until he reaches the recruiting office. In making examinations of an applicant's feet, it is well for the surgeon to show as little concern as possible, and keep his findings to himself if he intends to accept the applicant, for this reason, should the man enlist and later become dissatisfied with the service, he will immediately begin to complain of his feet and take this means of securing his discharge by medical survey.

The man with feet in which the arches are broken is useless as far as active military service is concerned, for he is not only unable to perform his work aboard ship where he is constantly on steel decks, but when ashore as a member of a landing force he is unable to walk any great distance without discomfort; and consequently will always be found among the stragglers. This type of foot is always a cause of permanent rejection and unless it is painful and causes difficulty in getting around, no advice is necessary.

The third and next important cause for rejections is defective teeth, which in itself is surprising when one takes into consideration the number of dentists in this country. Nevertheless, 27 per cent. of the rejections at the recruiting stations are for teeth which have been neglected until their condition is such that they are beyond possibility of repair. The minimum requirements of twenty sound teeth, of which there must be four opposing molars and four opposing incisors, with crown and bridge work counting as sound teeth, are fair, and a man's mouth could hardly be considered in good condition without conforming to this requirement. A peculiar coincidence I have noticed in the examina-

tion of applicants who have defective teeth is the frequency that defective vision is present in the same individual; from this I am led to believe that the man, with a mouthful of decayed teeth, develops a toxin which in some way is partially responsible for the condition of his eyes. Teeth, as we now understand them, are the cause of many of our ills, and as it is necessary for a man in the Navy to be in a constant state of good health his teeth must be in a good condition, otherwise, he is a victim of his own toxins; and living, as he necessarily has to, in confined quarters aboard ship he is less resistant to outside infections, as well as a menace to other members of the crew, through common use of the same drinking fountains and as a bacteria carrier. Men of this character are not desirable and must be rejected temporarily until they have the proper dental work done.

The foregoing causes of rejection are the three cardinal offenders met with and are ever present to such a degree as to disqualify more applicants than all other defects combined. Unfortunately, the former and the latter are conditions which undoubtedly play a great part in the early life of a young man, and with little effort could be remedied, thereby saving many boys, considered backward in school, the handicap of going through life with a meagre education, while their fellows who have had the advantage of proper care and treatment are able, because of their better state of health, to embrace every opportunity offered them. There is, I believe, a wide field for this sort of work in our schools and municipal health departments.

Another, but not so frequent a cause of rejection is defective hearing, due to perforations of the tympanum, inflammatory conditions of the Eustachian canal, impacted cerumen, etc. Perforation of the tympanum, of course, is permanent, producing a diminution of the auditory sense, and consequently is always a cause of rejection. Inflammations of the Eustachian tube may possibly be remedied to some extent, but I have seldom seen a case in which normal hearing—namely, ability to hear the whispering voice at fifteen feet or a ticking watch at forty inches—is restored sufficiently to enable a man to pass this standard test. Impacted cerumen is a minor condition and can readily be relieved, if the applicant will follow instructions.

Color blindness is another frequent and very important cause for rejection. In the Navy, especially, a man must have perfect color perception, and any signs of hesitancy or doubt he may display in selecting various color skeins must be carefully observed. Individuals with this defect are not safe men at sea, as can be readily understood when one considers that a fatal mistake may be made by a man who cannot distinguish between a red and a green light. There is, however, another very common condition, namely, color ignorance. For this, I can see no reasonable excuse, and I am convinced it should never occur if proper instruction had been given in the schoolroom.

Hernia and hydrocele are common, and while they are both a cause for permanent rejection, the recruit should be advised that a simple surgical operation will cure either one. Varicocele is of importance only when it is large, and as that also can be cured a minor operation should always be advised. The same is true to hemorrhoids. I find that proper explanation of these operations, the length of time necessary for recovery and the positive assurance the result will be permanent, is all that is necessary to send these men in search of a hospital and a surgeon, and at least 75 per cent. return and are enlisted in the Navy.

In conclusion, I desire to say that I have not attempted to cover the entire field of recruiting, from a medical officer's point of view, but rather from the standpoint of one interested in a hygiene problem which seems to me, if my experience is of any value, has been overlooked by persons entrusted with the welfare of our American youth, and I hope, since universal training has come to stay, physical requirements necessary to maintain the high standards of our forces will be better understood.

DISPENSARY PROBLEMS OF GONORRHEA AND SYPHILIS.

ALEC N. THOMSON, M. D.,
New York City.

Read before the Section on Public Health Administration, American Public Health Association, Cincinnati, Ohio, October 25, 1916.

A CLINIC in venereal disease from the doctor's viewpoint is more than a drudgery—it should be a means of training in medical science, and an educational opportunity in every sense. From the institution angle it is more than a chance to count heads and enter a total number of visits per year to make the dry rot of an annual report. From the community standpoint it is bigger than an elegant edifice supported by voluntary contributions. From the health department's conception it is more than an address that can be given patients applying for advice and diagnosis. It must actually coöperate in health work by providing treatment and aiding control. For the patient, for whom it was built, it must be of greater service than a place to go and get some No. 5 (of which he takes one t. i. d.) with a suggestion that he can get some more next visit—if he cares to come around again. It should encourage, teach, uplift and control.

In Brooklyn we believe in sufficient facilities. This means adequate quarters, proper equipment, ample staff, good publicity.

We believe that it is a clinic function to bring the patient under treatment and retain him until cured. This demands printer's ink, bulletin boards and other propaganda.

We believe in intensive treatment and control and that it is *not* our function to preach morals if by so doing we interfere with our public health function.

We believe that the staff must get well acquainted with the individual patient for the community benefit.

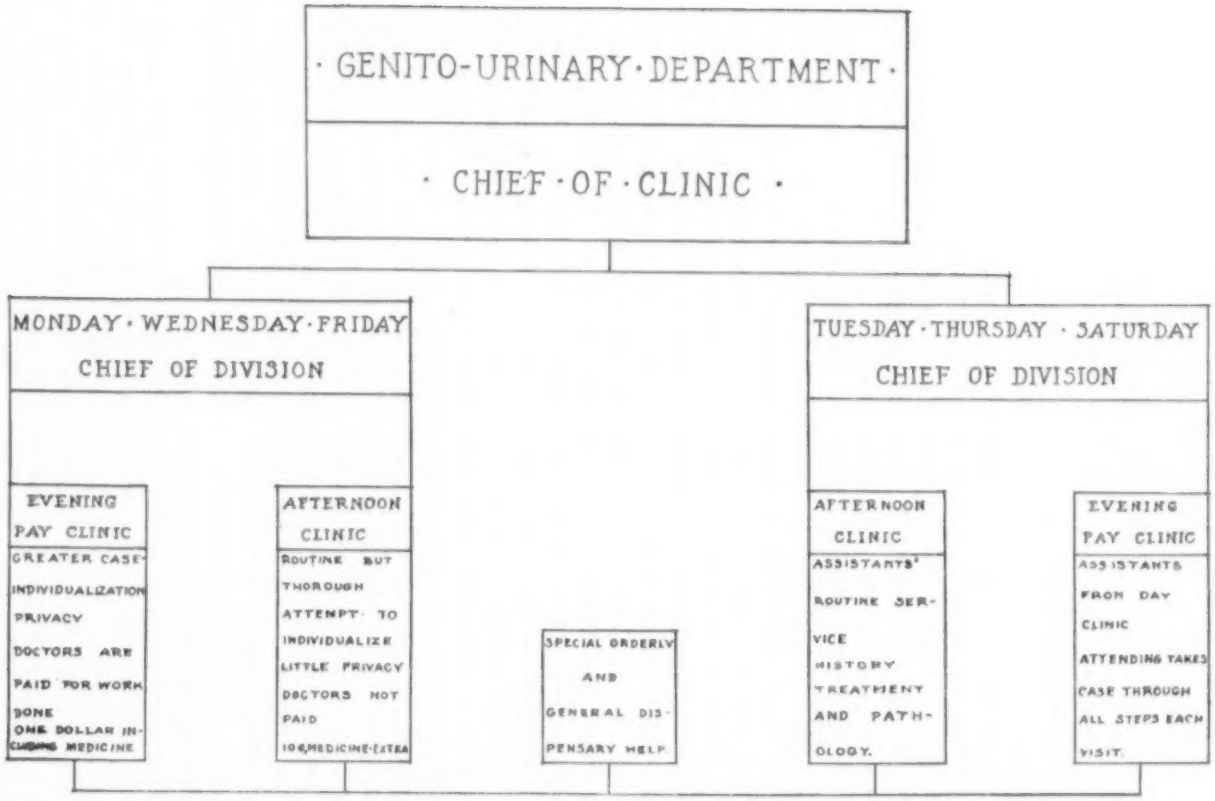
With this outline, permit me to demonstrate how we have tried to approximate these ideals.

The Genito-Urinary Department of the Brooklyn Hospital Dispensary was established by Doctor Rathbun in 1904, as sole worker. The gradual progression from the small beginning with one doctor attending two clinic days, to the present organization demanding fifteen doctors to properly care for patients at six afternoon, seven evening, and two morning clinic sessions, demonstrates the need for such a service.

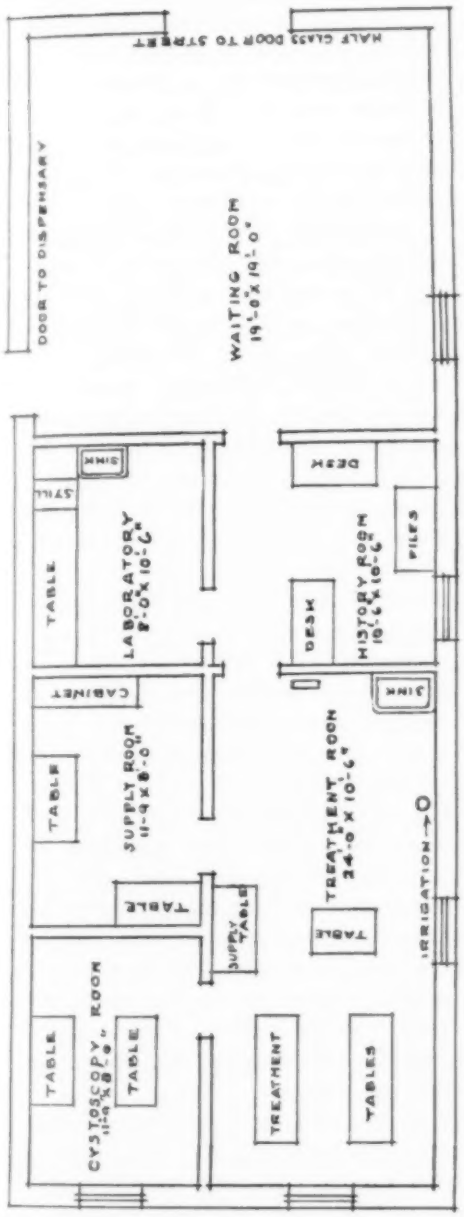
Irregular attendance and lack of punctuality is an efficiency destroyer from which we have been remarkably free.

Our organization is very simple in its component parts and can be shown in graphic form, each division being the same in all details. Notes apply, therefore, to both divisions.

The chief of the department is the visible head of all work. To the patient he is consultant and to the staff he



SCHEME OF ORGANIZATION OF THE BROOKLYN DISPENSARY



FLOOR PLAN OF THE BROOKLYN DISPENSARY

is instructor and critic. The day and evening clinics are in charge of a division director, so that each unit is distinctly separate in all details,—staff, history file, contact with patient, etc. The afternoon service is free, except for fees of ten cents per visit, with medicine at cost. For the evening service a charge of one dollar per visit is made, covering both treatment and medicine. The two divisions of the staff attend on alternate days, the same doctors being present both afternoon and evening of any day. This arrangement has been made in order to correlate as far as possible the "free" and "pay" services. Patients whose circumstances lead to a change from one clinic to the other, remain under the care of the same physician.

The department is located at the extreme end of the dispensary building and is practically a separate unit, having its own street entrance. The floor plan, as arranged, is convenient.

The department having been established and built up to its present state by the chief, and he being at all times in active attendance in both divisions, a few simple rules have tended toward a distinct uniformity of method which in no way interferes with the individuality of the division work.

Since the establishment of the evening pay clinic each division has its own filing system. Case histories are kept on paper sheets 10 inches by 11½ inches. These are folded once and filed, in envelopes, by number. A white cross-index card is filed by name and contains the case number. When for any reason a case history is closed it is removed from the active drawer

and transferred to the inactive file to await binding. As each one hundred histories are completed they are bound in a loose-leaf cover. In this manner all cases are readily found at any time. A further index, by disease, is made at the time of binding. All cases thus become available for either the day or evening clinic in the respective divisions. The files, being in the genito-urinary department history room, are accessible to both divisions in the event of any patient returning on the wrong day, or after the case history has been closed.

Through the topics under the headings "Referred By" and "Previous Treatment" much information of positive value in the extension of our working plans for the future has been obtained.

On the reverse side of the sheet nothing is printed. A rubber stamp for the continued record of the findings of the urological scheme is used as needed. When further sheets are needed, a simple continued history sheet is used. This contains one line for name, number and department division.

When the patient, in his turn, enters the history room, a complete history is taken at the first visit, or the history reviewed, if it be a subsequent visit. At each visit the patient's story is noted by the historian and the required examination and treatment ordered by the chief of the division. These orders are carried out in the treatment rooms and the results reported to and recorded by the historian who then gives any necessary prescription.

An institution working to protect the community must place the patient well in the foreground, although the object in organizing a venereal clinic is really twofold: First, the proper treatment of the patients, the prevention of reinfections and the spread of the disease to others; second, the scientific study of venereal diseases, the investigation and elaboration of methods of treatment, and the training of workers in this branch of medical science. The clinic effectively operating on this dual basis becomes a valuable factor in the education and protection of the public.

Our early experience and the increase in work done during the past three or four years showed us the need of other hours for treatment. A night clinic was established in 1908, on the dispensary basis, but it was not oversuccessful. We believe the reason to have been organization defects. It was not a pay clinic and there was no salary for the physicians. We had hoped to establish a pay clinic when the new building opened in 1912 but the time did not seem propitious for success. Having had four years for improvements in method, developing the attending staff, and the general organization, we can look for a steady forward movement in service to the public, to the welfare of the patient, and the efficiency of the doctors in venereal work.

In the first year our "pay" clinic showed a total of 2,671 visits, 109 the first month. The first month of our second year shows 424 total visits.

Protection of public health demands control of communicable disease. In

order to maintain supervision over cases until they are no longer a menace to the community, something must be done to regain control when the patient ceases treatment before being discharged as cured. To do this in the usual manner of social service work is obviously difficult. Personal visitation in routine venereal work is not practical unless under the direction of unusually qualified and tactful persons. The use of a card mailed in a sealed envelope, requesting a return visit, is simple and efficient. The envelope has a return address but not the institution name, thus eliminating home comment. At least three cards are sent before removing the case history from the active list. The interval between cards depends largely upon the degree of menace in each case. The "follow-up" is maintained by means of a card system. Each visit, note, reason for termination of case, etc., is recorded.

The third card sent is stamped "Your Last Chance." Frequently this does the work. The value of this method was tested during a six months' trial period. One division sent cards while the other did not. The divisions were parallel during the same period in the previous year. The division sending cards had 469 more visits as a direct result of this "follow-up."

The result of this simple method has been a decided increase of control by revisits to the clinic, return to private physicians or other hospitals and the resuming of treatment in other cities. This information reaches us by mail, by telephone, by friends as well as by personal return of patients. In the cases reached, about 62 per cent. who cease treatment before discharge are being heard from. The other patients who receive the cards and do not answer must also derive some slight benefit. One hundred and forty-five letters have been received from patients in one year. Seven hundred and twenty-two new patients with 6,897 revisits.

Each new case admitted to the Department is presented with a copy of a ten-page pamphlet upon venereal diseases. The effort to drive home the message by accent type, short sentences, common language, and the general arrangement has over-shadowed any attempt at literary style.

In addition to the Brooklyn Hospital Dispensary pamphlet, the New York City Department of Health pamphlet on venereal diseases is distributed. During the course of a patient's treatment, the Department of Health card on gonorrhea or syphilis is given and is a useful therapeutic measure. The patient must be inoculated with the stick-to-it-until-you-are-well idea. To do this demands constant advice and encouragement.

The door from the waiting room into the history room has a sign upon it, one by two feet. Across the top of this sign the patient is greeted each visit with the information YOU MUST COME TO THE CLINIC REGULARLY FOR TREATMENT, then appear the days that he is expected to return for treatment and a final line which reads, DO NOT STOP TREATMENT UNTIL THE DOCTOR TELLS YOU THAT YOU ARE WELL.

A bulletin board two by four feet

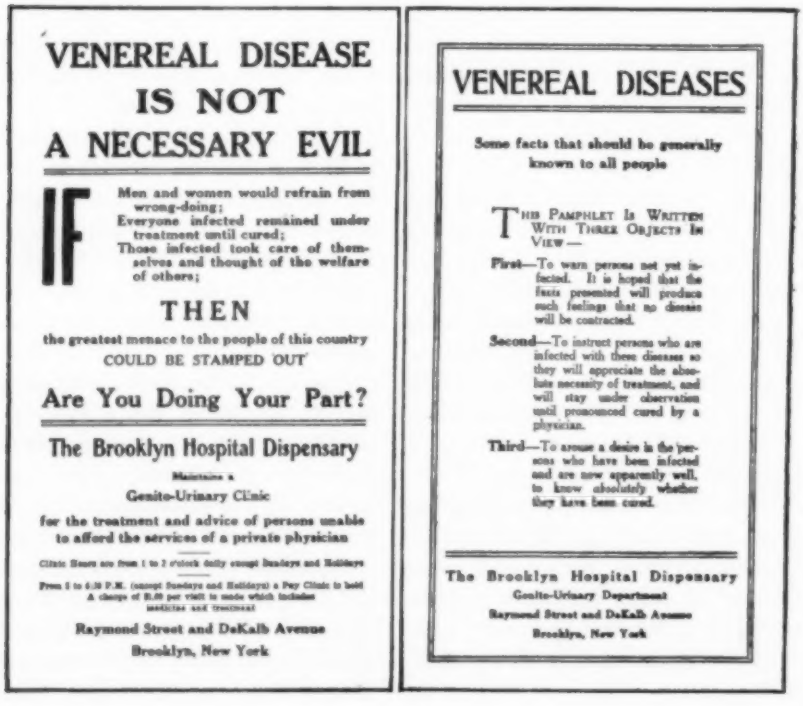
is hung in the waiting room. The basic matter upon it is always the same but it is variously presented. The arrangement is under three general headings: Prevention, Syphilis, Gonorrhea. The notices posted under these headings are in various shapes, colors, types, and wordings. They are changed weekly and they are usually in easily understood language and sometimes in common parlance.

Under the disease titles there are frequently posted the instruction sheets of other clinics and of various departments of health.

On either side of this board are frames for notices. One is permanent and the others are changed at intervals. The permanent notice reads:

THIS CLINIC WANTS TO HELP MEN
WE HAVE A PAMPHLET
EVERY PATIENT COMING HERE IS ENTITLED TO A COPY.
THE DOCTOR WILL BE GLAD TO GIVE YOU AN EXTRA COPY.
HAVE YOU A FRIEND IN NEED OF HELP? SPEAK TO HIM.

The notices to be changed cover hygienic points such as care of the teeth, cleanliness, diet, etc. Four other boards in the room carry a good and bad exhibit. The "good" exhibit includes the Department of Health and the Brooklyn Hospital



VENEREAL DISEASE
IS NOT
A NECESSARY EVIL

IF
Men and women would refrain from wrong-doing;
Everyone infected remained under treatment until cured;
Those infected took care of themselves and thought of the welfare of others;

THEN
the greatest menace to the people of this country
COULD BE STAMPED OUT

Are You Doing Your Part?

The Brooklyn Hospital Dispensary
Maintains a
Genito-Urinary Clinic
for the treatment and advice of persons unable to afford the services of a private physician

Clinic Hours are from 1 to 2 o'clock daily except Sundays and Holidays

From 7 to 8.30 P.M. (except Sundays and Holidays) a Pay Clinic is held
A charge of $1.00 per visit is made which includes medicine and treatment

Raymond Street and DeKalb Avenue
Brooklyn, New York

VENEREAL DISEASES

Some facts that should be generally known to all people

THIS PAMPHLET IS WRITTEN WITH THREE OBJECTS IN VIEW—

First—To warn persons not yet infected. It is hoped that the facts presented will produce such feelings that no disease will be contracted.

Second—To instruct persons who are infected with these diseases so they will appreciate the absolute necessity of treatment, and will stay under observation until pronounced cured by a physician.

Third—To arouse a desire in the persons who have been infected and are now apparently well, to know absolutely whether they have been cured.

The Brooklyn Hospital Dispensary
Genito-Urinary Department
Raymond Street and DeKalb Avenue
Brooklyn, New York

Dispensary sign plates, pamphlets, instruction cards, etc. The "bad" boards show a most motley array of quack and patent medicine signs, the spoils of our "tear down the fake" and "put up the true" campaign.

Given the organization, equipment, and desire to serve the community through the patient, the road leading to the greatest degree of success is coöperation with other bodies striving in the same field but with different parts of the work.

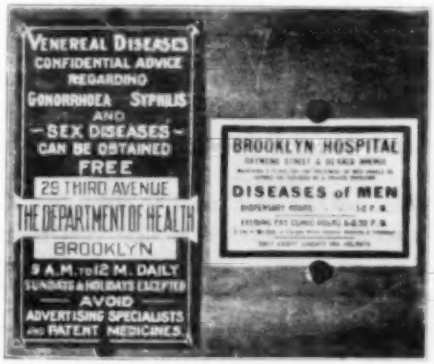
Invasion of the domain of quackery by the Department of Health had been successful. Meeting fire with fire had been found to work. With the co-operation of the Committee of Fourteen of New York City, the Brooklyn Hospital Dispensary offered to place the Board of Health plates in its territory.

After various conferences with the Department of Health, the Committee of Fourteen and the Liquor Dealers Association of Brooklyn, metal plates offering the facilities of the Department of Health for advice and diagnosis, and of the Brooklyn Hospital Dispensary for the treatment of diseases of men were made and placed in saloon toilets, factories, etc.

Our first sign was placed January 28. In all about 180 saloons have been visited and 175 of our signs placed. When our signs go up the quack signs come down! In 19 saloons no signs were found. In 98 saloons over 300 quack signs were removed. We have been refused permission in 27 saloons and of these but 8 had quack signs.

Coöperating with other organizations, we entered upon another publicity scheme this summer. Sex education, advisory and diagnostic service, and the combating of quackery were combined. Mr. Osborn, secretary of the New York Social Hygiene Society will enlarge this topic in the discussion.

Our records show a preponderance of new cases recorded as "Referred by Patients" and a few as "Otherwise."



We have been able to trace 200 new patients to the signs and the Coney Island Health Exhibit. It pays to advertise.

We know that this work has been of value. It is certain that good must follow, and an ever increasing number of men be brought and kept under treatment until no longer a menace to the community. This will not only apply to the Brooklyn Hospital Dispensary, but through awakening a desire for knowledge of certain cure in the patient, it will surely follow that many men will return to the private practitioner.

Permit me to reiterate a few points that have, I hope, been illustrated in describing our organization.

The protection of the community against the venereal peril is a great big coöperative problem. I say cooperative because unless the educational system, the health authorities, the workers along religious, social and moral lines combine with those of us who are in the treatment phase of the work, the maximum of good will not be obtained.

We must provide accurate information on sex hygiene to the uninfected. We must give advice and diagnostic service to the persons exposed or exposing themselves to infection. We must establish treatment facilities on a high standard of efficiency. All phases of the work must be given free, if needed, or at such a modest cost that they are easily available to all the community. A campaign that will educate the public, the medical profession and social welfare workers to the seriousness of the situation now confronting this country, must be instituted—a campaign that will parallel the work in tuberculosis, cancer, etc., but without any scare element or hysteria.

Publicity and education will deprive the quack of his biggest assets,—mystery and ignorance. The fake medical schemer has been hard pressed during the past few years and further plans for the complete abolishment of quackery must include treatment facilities of good repute, adequately advertised to the public.

Publicity and education should go hand in hand. Health departments in their advisory capacity tend to greater publicity—for nothing carries greater weight than governmental documents. Social hygiene societies, clubs, churches, associations of young men and women can and are doing excellent work in sex hygiene. More publicity and further education are needed before the effect upon the incidence of venereal disease will be measurable.

Granted that the quack is cornered and only needs to have the death blow administered; assuming that the laity is being taught social hygiene and greater publicity is required; appreciating that the facilities for diagnosis now at hand are being used and can be enlarged to meet future needs; *then* the problem facing us is the provision of high grade treatment facilities for the cases now being encountered. This is a very important division of the forces available in the coöperative warfare that must be waged against venereal disease.

Affiliation with other bodies such as the American Social Hygiene Association, the local and state society as well as with business organizations in the territory about the institution will be of great value to the clinic and to the community. The whole community, both public and private, should coöperate for the mutual advantage of the state, the patient and the not yet infected citizen.

Nothing can be judged without the passing of time. The question of pay clinics in the special branches of medicine and surgery is a vital topic that is in its infancy. Some adequate facility must be provided for each group of our population in need of special attention, including a place in the community for specialized treat-

ment of the patient unable to afford the properly equipped private practitioner's charge, who is barred from patronizing the dispensary by reason of his work, his pride, or his financial ability to pay a modest fee.

In the sphere of venereal disease, every facility that can possibly be provided for early diagnosis and proper treatment is of paramount importance in protecting the individual, advancing knowledge, perfecting treatment, training workers, combating quackery, promoting social hygiene, and conserving the public health.

We hope to see the sum total of typhoid reduced, we wage unceasing war upon tuberculosis, we rejoice at the practical suppression of smallpox, we quarantine against the exanthemata and we must now enter on a broad-minded campaign for the elimination of Neisser and Treponema infection with its far greater social and economic loss in every walk of life and branch of government.

VENEREAL DISEASES IN THE WAR ZONE.

In the war zone of France there has occurred an alarming increase of venereal diseases both amongst the soldiers and the civilian population. There can be no doubt that an increase in clandestine prostitution is the principal cause of this state of affairs; but it is also certain that this epidemic has been propagated among the classes which might have been hoped to remain unaffected, and that many married women, including the wives of men at the front, have been infected and will ultimately contribute to the spread of the disease. On account of the gravity of this venereal peril, the medical service of the army has reinforced the prophylactic measures, particularly by creating special organizations for the diagnosis and treatment of these diseases. These organizations are divided into (1) urology, (2) dermatology and syphilology centers. To these centers are to be sent as early as possible not only all patients with characteristic chancres, but also those presenting the slightest suspicious erosion or ulceration. It is expressly forbidden to keep under observation at the regimental hospital a man presenting a suspicious ulceration in order to clear up a doubtful diagnosis There is one venereologic center for each region, composed of a hospital service, a consultation service, a dental service and a laboratory. The special function of the dental service is to prepare the teeth of syphilitics preparatory to intensive mercurial treatment. This intensive treatment by salvarsan and mercury is necessitated by the urgency of returning valid men to the army as soon as possible. Orders have been issued that periodic lectures on venereal diseases shall be given in all depôts and in the medical formations of the army, and that pamphlets on this subject written in a clear and concise style shall be distributed in order to propagate correct ideas on prophylaxis. Further, the military surgeons are called on to lend the utmost support and collaboration to the civil authorities to insure the best possible conditions for the working of the venereal service for civilians of both sexes. Daily consultations will be given, the hours of which will vary from day to day, thus making them accessible to all classes of patients. On the other hand the Ligue Française, being of the opinion that the present means of fighting the extension of venereal diseases are inefficacious, has proposed that these diseases be assimilated to other contagious diseases by the adoption of quarantine. Infected women would then remain isolated in special hospitals until cured.—*Medical Officer*, London.

MAINE'S NEW HEALTH LAW.

C. E. Turner, M. A.,

Instructor in Biology and Research Associate in the Department of Biology and Public Health of the Massachusetts Institute of Technology.

AT THE adjournment of the seventy-eighth legislature of the state of Maine on April 7 the newspapers commented at length upon its acts relating to war, suffrage and prohibition, but nothing was said about a matter no less important to a modern democracy: namely, public health. And yet this legislature and the progressive administration of Gov. Carl E. Milliken are to be credited with giving the state a form of health organization second to none in the country, one which is sure to place Maine among the leading states in preventing disease and safeguarding the health and welfare of its citizens.

The act creating a State Department of Health was introduced and supported by the State Medical Association, acting through its legislative committee. The influence of this organization is widely felt in Maine, and from such an association with its Committee as that enjoyed by the writer during the recent campaign for re-organization it is apparent that the continued and assured support of this wide-awake and progressive body of physicians will be of inestimable value to local public health progress. The support accorded to the measure by many leading educators, scientists and public men in the various parts of the state was also important. Their statements, together with strong letters from prominent summer residents, public health experts, and statesmen elsewhere, assisted materially in placing the case clearly before the legislative bodies, particularly the Public Health Committee of the legislature, before whom the bill had its hearing. This committee gave to both the main provisions and the details of the plan a careful and intelligent consideration. After being convinced of its worth, they worked with the proponents of the bill to secure its presentation in the most desirable form and reported unanimously in favor of its passage.

The establishment of a State Department of Health is a step in advance which clearly expresses the growing appreciation of public health activities in Maine and a desire that the state shall secure the most efficient method available for the prosecution of this work. The State Board of Health which the new organization is to supplant was created in 1885 and has an excellent record of efficient and faithful service. Its early and authoritative reports upon school hygiene, disinfection and the prevention of tuberculosis as well as such activities as the development of the permanganate process for liberating formaldehyde gas and special methods of public health education, have met with nation wide approval. Moreover it is significant that Maine, which was fourth from the last among the states in establishing a board of health, is now among the very first of the states to institute such a re-organization as authorities agree is best calculated to administer the increased public health duties of a state department.

The need of re-organization in Maine arose from a condition which is not today peculiar to that state. The Board of Health, which was created at the time when sanitary science was in its infancy, found itself overburdened by the increasing activities placed upon its shoulders through the recent advances of the science. Bills to allow the Board to embark upon new fields of endeavor have been almost constantly before the legislatures of recent years. Among these bills, for example, have been requests for district sanitary inspectors and for state inspection of hotels and summer camps. Such piecemeal legislation however was hard to secure, and the board remained with limited activities and appropriation.

It was evident that the State seriously needs improvements in local health administration. A few of the summer resort towns, of which York is a conspicuous example, are securing the services of a well trained, full time local health officer, and the experiment in York has been so success-

ful from every point of view that after three years of trial the renewal of an appropriation of one dollar per capita for public health work was voted unanimously at the last annual meeting. But in most towns of the state there is need of a direct stimulus for health work.

Other needs are, more effective work in the control of contagious diseases, better provision for the distribution and use of sera and vaccines, the extension of educational work, and definite campaigns for the protection of child life and for the prevention of tuberculosis. There are many labor and pleasure camps in Maine, as well as the numerous hotels over which the state might well institute an effective supervision.

These improvements it was believed could be best assured by a comprehensive reorganization, and consequently a bill was proposed following in general the New York-Massachusetts plan, which provides for a State Department of Health consisting of a commissioner and a Public Health Council, together with directors of divisions, district health officers, and other employees.

In Maine the law provides that the Commissioner, a man experienced in public health administration, shall be appointed by the Governor for a term of six years. Upon him rests the responsibility of administering the laws and regulations relative to health and sanitation. He shall prepare rules and regulations for the consideration of the Public Health Council, appoint directors of divisions, district health officers and other employees, submit annually to the Public Health Council recommendations regarding health legislation, and perform all executive duties previously required of the State Board of Health. He has power to direct any executive officer or employee of the State Department of Health to assist in the study, suppression or prevention of disease in any part of the state.

The Public Health Council is to consist of the commissioner and four other members, two of whom shall be physicians, to be appointed by the Governor for a period of four years. It is to meet once a month and at such other times as its members may determine, and it will be the duty of the council to make and promulgate rules and regulations in furtherance of the public health law, to advise the commissioner upon the appointment of district health officers, and other employees, and to recommend to the legislature needed health legislation. It is to have no administrative or executive duties.

There are to be such divisions in the State Department of Health as the commissioner, with the approval of the Public Health Council may from time to time determine, and the commissioner with the advice of the council, is to appoint and may remove a director of each division.

The Commissioner from time to time is to divide the State into three or more health districts appointing to each district a district health officer who shall be a graduate of an incorporated medical school or shall have been certified in public health by a reputable institution of collegiate grade. These men are to spend their full time in the field work of the department.

The bill provides that the Commissioner of Health shall receive an annual salary of $4,000, that the Public Health Council shall receive $5 a day while in conference and their necessary travelling expenses, and that the compensation of directors of division and district health officers shall be fixed by the Commissioner of Health but shall not exceed $2,500 per year.

Public health workers may feel that the annual appropriation of $30,000 which this bill carries, is indeed a small sum upon which to begin the work of such a state department. If Maine should spend 2 per cent. of its total appropriation upon health work, a proportion which Surgeon Carroll Fox of the federal service suggests is a fair distribution of funds, the department would receive $142,000, while the Massachusetts expenditure of 1.2 per cent. would give the department $80,000. But it should be remembered that the original appropriation with which the State Board of Health began work in 1885 was only $3,000, that it has never exceeded $20,000 and that it is still the privilege of health administrators generally to do a large amount of work on a small amount of money. Moreover the last legislature passed an additional act providing for the making of Wasserman tests and giving the health Department an annual appropriation of $4,000 for this work.

Another act, which preceded the health bill in

its enactment, placed the responsibility of preventing the pollution of public water supplies in the hands of the Public Utilities Commission, allowing them $4,000 a year for this work. So that, although it may be generally believed that this duty belongs to the State Department of Health, which has a laboratory already equipped for doing sanitary water analysis, the Department for the present at least is relieved of this financial responsibility.

The task of the new department is not an easy one but it is confidently hoped that this type of organization which has been instituted in New York and Massachusetts with highly satisfactory results, being continued from year to year with its original freedom from political system and with a general coöperation for increased efficiency, may yield to Maine all that it has given to these other States in decreasing the amount of preventable disease and promoting the health of its citizens. Its organization upon a non-political basis is assured, and the centralizing of authority, the appointment of district health officers to stimulate the usually well-meaning but often ineffective local boards of health, together with the opportunity for new and specially profitable fields of activity, are sure to give both the permanent residents and the summer guests of the State of Maine the best available health protection.

BLINDNESS IN THE UNITED STATES.

The forthcoming report on the blind in the United States announced by Director Sam. L. Rogers, of the Bureau of the Census, Department of Commerce, indicates that 30.8 per cent., or somewhat less than one-third, of the blind population lost their sight when less than twenty years of age (including those born blind); 47.4 per cent., or somewhat less than one-half, during the early or middle years of adult life (from twenty to sixty-four years); and 21.8 per cent., or a little over one-fifth, in old age (after passing their sixty-fifth year). More persons were reported as having lost their sight when less than five years of age than in any other five-year period of life, 16.4 per cent., or about one-sixth, of the total being included in this group; persons reported as born blind formed 6.6 per cent. of the total and persons reported as losing sight when less than one year old 5 per cent., these two groups together contributing 11.6 per cent., or more than one-tenth, of those reporting the age when vision was lost.

These statistics are based on an enumeration of the blind made in connection with the census of 1910. The blind population enumerated was 57,272, and by sending out special schedules through the mails the bureau obtained data regarding such subjects as the cause of the blindness and the age when it occurred from 29,242 blind persons.

The fact that the 30,000 blind represented in the returns had on the average been blind for sixteen years makes plain the gravity of this misfortune. Although the risk of blindness in infancy, childhood, or youth is relatively small, yet, as shown by these figures, the complete elimination of that risk would reduce the blind population by nearly one-third.

Since 1880 there has been a distinct decrease in the proportion of blind who lost their sight in infancy. In 1880 persons who became blind before completing their first year of life formed 15.3 per cent. of the total reporting, as compared with only 11.6 per cent. in 1910. This decrease is explained largely by the great progress made toward preventing blindness among new-born infants through the use of the Credé method of prophylaxis for ophthalmia neonatorum, which was discovered in 1884.

The proportion of the blind who lost their sight during the early or middle years of adult life has increased somewhat since 1880.

This marked difference with regard to the period of life when loss of sight occurred is of course the result in the main of the cases of blindness from industrial accidents or occupational diseases, which are numerous among the male blind though relatively few among the females.

Book Reviews.

The Adolescent Period. *Louis Starr, M. D., L.L. D. P. Blakiston's Son & Co., Philadelphia. 1916. 210 pp. Price, $1.00 net.*

A surprising book in many ways is "The Adolescent Period" by Doctor Starr. It contains many practical suggestions, apparently gleaned from the author's own experience, for dealing with the problems of this period. Some of these are modern in spirit, and concrete in form, and generally calculated to be of use to either parents or teachers. In one sense, the appeal of the book is limited, for most of the suggestions are applicable only for the people who "motor" and send their boys to the expensive and English type of boarding school.

The first chapters deal with normal growth through adolescence, and the specific types of physical education which the author favors. The disorders of adolescence are next considered. There is a tendency here to imply that extremes are averages, which might make the parents over anxious. Such diseases as epilepsy, hysteria, dementia præcox, neurasthenia, and others are mentioned almost as symptoms of adolescence, and discussed with a detail, and yet necessarily with a lack of a background, hardly justifiable in so short a book.

The last three chapters deal with the faults and criminal tendencies of adolescence, menstruation, and sexual enlightenment. They too contain a surprising mixture of modern teaching and dogmatic, arbitrary, and conventional statements, apparently based on what the author holds to be "common knowledge" rather than on any scientific investigation. Where the boys are spoken of, there is considerable authority of tone but Doctor Starr's knowledge of girls is not convincingly first hand.

Such statements occur as "the theft habit is very difficult to eradicate, especially in females"; and "of purely mental processes her [a girl's] ideas of form—squares or triangles—are better than of objects—plants or animals; her memory is good from ten to fourteen, but poor before and after; . . . she is not so good an observer, is apt to be inaccurate in describing occurrences, and swayed by selfish interests, is more given to exaggeration and falsehood." These seem to call for some citing of authority.

The author does not underestimate the importance of menstruation in a woman's life. "All her acts, opinions, and even criminal tendencies must be estimated by their time association with it. . . . During her first period the girl must rest in bed until the hemorrhage is completely over. Subsequently, at least three days should be passed in bed, and two or four more idling about her room, dressed, but most of the time flat on a lounge. . . . With the bodily, there must be mental rest. . . and while mildly interesting reading, fancy work or other unfatiguing occupation may be followed, the mind must not be taxed by exciting novels or intricate hard work."

To a mind weary with controversy and theory, there will be a charm about the rather definite ages which the author gives for sex enlightment on various subjects, and the ages at which definite crimes most frequently occur.

The two points most emphasized in this book are the necessity for a very different mental and physical training for the adolescent boy and girl, and the danger of over study for all children.

Eunice B. Armstrong.

Poverty and Its Vicious Circles. *Jamieson B. Hurry, M. A., M. D. J. & A. Churchill, London. 1917. 180 pp. P. Blakiston's Son & Co., Philadelphia. Price, $2.00 net.*

Once again Dr. Hurry has given us a stimulating and constructive piece of work. Not only the author with something fresh to say deserves hearty appreciation; the man who says something in a fresh way also enriches us. It was the graphic freshness of vision, the wide view of a vast field that made Dr. Hurry's earlier book on "Vicious Circles in Disease" of such value. The many readers who benefited by the unusual form, as well as the clarity of the first work, will read eagerly this year's larger contribution.

The first book was valuable in that it suggested a helpful way to look at a great problem, or a

great number of problems. This later study uses this method of seeing cause and effect in their characteristic circular form, as a means to discuss a wide range of problems. The book is full of most useful references to many authorities and shows the author's wide knowledge of many inter-related problems.

Its careful fairness of statement, and its unhampered thought are an unusual combination. Many writers would be content to take merely one of these circles and write a book about it. Its wealth of suggestion is what will make this book almost a necessary index to thought along these lines.

The table of contents alone is interesting reading: "Circles Associated with Defective Housing; with Excessive Fecundity; with Unequal Taxation; with Employment of Women and Children; Poverty a Self Perpetuating, Self Aggravating, a Fatal Disorder; the Breaking of Vicious Circles by Legislation, Voluntary Organizations, and Individual Effort. These are but a few of the chapter headings in this valuable work.

Donald B. Armstrong, M. D.

The United States Pharmacopœia. *9th rev. edition. The Surgeon General, U. S. P. H. Service, Washington, D. C. 1916. 80 pp.+728 octavo.*

The book, in appearance, resembles the previous edition of the Pharmacopœia, now out of date, though everything in the book has been revised. The introductory pages give a table of contents, historical introduction, with review of the proceedings of the ninth decennial convention in 1910, also a preface in which is outlined the changes in the book. Several tables together with a review of the International Protocol compared with the drugs and preparations of the U. S. P. IX are given; also lists of admissions, deletions and changes in the official titles, both in Latin and English, followed by tables of comparison showing the strength of the more important preparations in the preceding and present editions of the Pharmacopœia.

The main part of the book comprises 497 pages and contains monographs for 782 articles, including 9 general headings, 188 drugs, 265 chemicals and 320 preparations, as against 958 articles in the U. S. P. VIII. In this edition a net decrease of 176 articles was made, while there were 29 changes in official Latin titles and 28 in official English.

The other part of the book includes a table of atomic weights based on oxygen as 16, a table of the elements and pharmacopœial chemicals, and their value in molecular weights, a table of multiples, also a list of reagents, test solutions, volumetric solutions and directions for testing. The table of alcoholic contents in preparations is given and followed by directions for determining the alcohol, for making alkaloidal assays and for determining certain physical and chemical constants, together with notes for sterilizing and percolating. An extensive list of diagnostic reagents and clinical tests is given, together with alcoholometric tables, tables for temperature corrections and thermometric equivalents. The usual acid, alkali, weight and volume relations tables are given, also tables for converting metric quantities into apothecaries' weight and measures. Among other things mentioned the change in connection with opium appears important, in that it complies with the international treaty of 1906 placing it on a 10–10.5 per cent. basis of anhydrous morphine in place of from 12–12.5 per cent. of the crystallized as mentioned in U. S. P. VIII. Again, a very important change is the statement regarding the maximum and minimum strength of preparations. The usual index is found thus completing the book.

J. Gaub.

The National Formulary. *4th edition. The Surgeon General, U. S. P. H. Service, Washington, D. C. 1916. 40 pp.+394 octavo.*

This book is distinct from the preceding editions, in appearance. The introductory portion of the book includes a short history, and a preface in which the changes are summarized. This portion of the book contains a list of preparations added and dropped from the formulary; also a list of changes in the official Latin titles together with some special notes of importance and a complete discussion of sterilization.

The main part of the book has three parts.

The first part has 255 pages and contains 596 titles, together with 12 general formulæ and 584 galenical preparations. The net gain in additions and deletions was 18 over the third edition. Ninety fluid extracts are included of which 50 are new and 30 were taken over from the U. S. P. VIII. The elixirs constitute the second largest group of preparations, numbering 79. Next is found 54 titles of solutions followed by 50 tinctures. Among the new preparations found are fluidglycerates, sprays, and ready made petroxolins; the steatins or slave mulls of N. F. III are given as mulls.

The second portion is devoted to descriptions of standards for drugs used in their preparations, but not included in the U. S. Pharmacopœia; it is new. This part covers 98 pages, describing 186 drugs, 140 of vegetable origin, 6 of animal origin and 40 chemicals. This part of the Formulary was prepared by the Committee on Standards of the Pharmacopœia under the direction of Mr. George M. Beringer as chairman.

In the third part a novel feature is found, in that many special tests reprinted from the Pharmacopœia by special permission appear. Then there is the index which completes the book.

Both the National Formulary and the Pharmacopœia fix a minimum and maximum requirement for purity which come close to theoretical perfection. It is hoped that these improved standards are practically applicable, and that it will be possible to attain the new requirements and that the methods of assay will help to insure physicians and their patients the uniformity of strength and composition in the drugs and preparations that will be used.

J. Gaub.

Health Department Reports and Notes.

REPORTS.

New Bedford, Massachusetts.

The 1916 Annual Report of the Department of Health of this large New England mill city of 118,000 population reports a lowering of the death-rate per 1,000 population to 15.31—the lowest on record. Of the 1,810 deaths, 485 were of children one year of age or under, giving an infant mortality-rate of 131.85 per 1,000 births, as compared with a rate of 134.55 for 1915.

The health authorities, however, realize the problem of the reduction of this rate to be a most important problem, and not only have instituted excellent remedial measures, but too have been forced to meet the situation of a declining birth-rate. In 1909 the birth-rate per 1,000 inhabitants was 43.3, while in 1916 it was 31.1. A classification of infant deaths has shown that prenatal influence and improper feeding are the two main factors in this city's infant death-rate, and work along these lines has been inaugurated. It is hoped by the addition to the nursing staff to follow the baby through its first year of life. From the fact that over half of the infant deaths were among the Portuguese, it is shown that much improvement can take place through the social organizations of these people—and such a coöperation is hoped for.

From an excellent discussion of tuberculosis it is evident that this disease is causing a severe strain on the department's appropriation. In this connection it is seen that of a total expenditure of $50,337 for communicable diseases, $44,651 goes for the care and treatment of the tuberculous. The main problem seems to be concerned with the care of the advanced cases, which the state refuses to admit to its sanatoria, thus thrusting a great responsibility on the municipal department—a responsibility which, the report indicates, should be borne by the state, at least partially. Notwithstanding this, the department has been most active and efficient in its efforts to stem the tide of this disease. A reduction of reported cases is noted, though an increase in deaths is reported. From a classification of occupations it is seen that the cotton mill operatives exceed to a great degree all other classes in contracting tuberculosis, though this class has shown a reduction for the year reported.

Both in 1915 and 1916 an interesting and marked falling off of cases of scarlet fever and diphtheria has been reported, particularly among school children. This is due directly,

it is believed, to the intensive education of the parents relative to these two diseases. Morbidity-rates for the other common infectious diseases remained comparatively normal, though an increase due to poliomyelitis is noted. However, only one death resulted from this cause. There were reported 65 cases of typhoid fever, resulting in 5 deaths, giving the low rate per 100,000 population of 4.2. In this connection, New Bedford attained third place among cities of her class, as reported by the American Medical Association in their Fifth Annual Survey of Typhoid Fever in the Large Cities in the United States for 1916. In 1915 this city had a typhoid fever death-rate per 100,000 of 18.2.

Terminal fumigation has been supplanted by thorough mechanical cleansing with no ill effects, though with a considerable saving in time and money. The problem of garbage collection and disposal had again to be met with by this city, resulting in the collection being done by the city highway department, and the disposal of the garbage let out by contract. The old system failed, due to increased cost in operation.

The report itself is well prepared, observing a nice sequence. A table of contents adds to its usefulness.

The Island of Porto Rico.

From the report of the Director of Sanitation of Porto Rico, more particularly from the report of the Division of Transmissible Diseases and Bacteriological Laboratory, under the direction of Dr. José Brioso, it is seen that the short-sighted policy of the federal government in reducing its appropriation for insular health work is reaping its most natural harvest,—an increase in disease incidence and mortality. In 1913–1914 a mortality of 18.6 per 1,000 was reported for the whole island; in 1914–1915, a rate of 19.7 was reported; and in 1915–1916 a rate of 21.9. An epidemic of smallpox and dengue occurred on the island during the year but of not sufficient proportions to materially affect the general mortality-rate. The reasons, as explained by the report are, first, the reduced appropriations; second, the increased prevalence and increased mortality from malaria and tuberculosis, due directly to the fact that no appropriation had been made for a proper campaign against either of these diseases; and, third, to the lack of proper nourishment "which is reported to have existed in certain sections of the Island and which has shown itself by a disproportionate increase in deaths in the very young and the very old." Furthermore the births reported for the year are 1,357 less than for the previous year, and the number of deaths of children under 1 year of age has increased by 307, and between the ages of 1 and 2 by 414.

For fifteen years smallpox has been practically unknown on this island, yet for this reported year the occurrence of an epidemic of smallpox must be recorded—529 cases throughout the Island. Its occurrence was directly due to the failure to vaccinate, and this failure was due to, first, lack of funds, second, to lack of sufficient personnel, and third to lack of interest on the part of the public. The disease was epidemic in May, but within three months was completely eradicated, conclusively proving the effectiveness of the means used to combat it. The creation and maintenance of a vaccine station is urged, since for effective vaccination it would be necessary to vaccinate 250,000 persons yearly on the Island.

There were reported 443 cases of malaria which next to tuberculosis is the prevailing disease on the island. Typhoid fever is constantly decreasing and it is a good sign to notice that the people are beginning to realize the necessity for sanitary care. In this connection, in 1911–1912, the first year of the organization of this service, there were 950 cases of typhoid reported with 131 deaths, and in this year there were only 145 cases with 94 deaths; 14,662 persons were treated for uncinariasis, of whom 37.4 per cent. were cured. The reduction in appropriation again reaps its results, for such a reduction in conjunction with the increased cost of drugs has necessitated the reduction in the number of dispensaries in the interior and has practically compelled the abandonment of the treating of this disease in towns.

Tuberculosis increased during the twelve months reported by 307 deaths, thus causing 2,274 deaths. While funds have been appropriated for the present year to combat malaria, not one cent has been appropriated to combat

tuberculosis, and thus it is expected that this disease will still increase in its ravages.

The bacteriological laboratory has accomplished results far in excess of expectations, limited as they are by lack of facilities and funds. Medical inspection of schools has been inaugurated, though up to the time included in this report no more than 500 examinations had been made, yet the results of these demonstrate the importance of such examination.

From the conclusions it appears that the difficulties of the work of this department are seriously increased by the failure of the courts to impose punishments in any way adequate or proportionate to the gravity of the offense committed. And such decisions and inadequate sentences imposed must not only encourage the violators of the law but, too, discourage the officers of the service.

As with the previous year's report this report represents a combat between effective health work and ignorance, indifference and prejudice. Within the last two years, to these already severe enough existing conditions, there has been added the almost unsurmountable condition of lack of funds, due to a constant diminution of the appropriation. Where the first three conditions can be slowly but surely eliminated by education and instruction, the last condition can only be eliminated by fair legislation, a problem which we could so easily and should so readily solve.

Medical Department of the United Fruit Company.

The Annual Report of the Medical Department of the United Fruit Company for the fiscal year ended September 30, 1916, reports extensive additions and improvements in the hospital facilities of the several divisions of the department. The prevailing disease of all three divisions, that is, the Banes, Nipe, and Tela Divisions was malaria, though the sanitary measures in force during the reported year materially decreased the number of cases. The treatment has been standardized in all divisions in line with previous experience. Amœbic dysentery is still reported from Costa Rica and Santa Marta, but it is expected that the system of water filtration under construction in these districts will soon mitigate the existing conditions. In this connection it has been found by clinical experience that emetine alone does not cure this disease, but that following its use, large doses of bismuth subnitrate, properly administered, brings about permanent results. Many cases of chronic leg ulcers come to the hospitals, and these materially increase the number of hospital days and are most tedious, so that hereafter measures have been adopted to prevent the employment of men already afflicted in this manner. Uncinariasis, or ankylostomiasis, is present in considerable amount, and oil of Chenopodium has been found to be the most effective vermifuge. In the Nipe division, of 3,452 stools examined, about 13 per cent. showed signs of the hook worm infection.

This medical department has over sixty thousand persons dependent upon it for treatment, not including the passengers, officers, crews and ship laborers on its steamships. An interesting commentary upon the effectiveness of the department's work is the fact that of these thousands of dependents, there were over eighty-two thousand patients treated at the company's hospitals and dispensaries, and of this number there resulted a death-rate, per 1,000 persons dependent, of 7.54.

The report itself contains many valuable tables of particular significance to those interested in tropical medicine, and sets forth extensively the scheme of the organization of the department and its general instructions.

NOTES.

Community Health of Cities in Middle and Western Pennsylvania.—During the weeks of March 12 and March 19, 1917, the Metropolitan Life Insurance Company with the coöperation of the health and philanthropic agencies in the cities of middle and western Pennsylvania conducted a health census among its policy-holders and among the general population of those cities. The inquiry was made through the company's agency staff. The health status of a little more than 328,000 persons was ascertained, among whom were found 5,789 cases of sickness. In some of the cities the survey reached over 20 per cent. of the total population.

It is especially important to know that this representative portion of the population in the cities surveyed included a large number of men, women and children of the wage-earning classes. The findings of the census may be conservatively held to represent health conditions among the population, and especially the working classes, of the mining and iron and steel regions in Pennsylvania.

For all the cities combined, the sickness-rate was 18 per 1,000. The following table shows the principal facts of sickness among the occupational groups represented in the survey:

TABLE I.

SICK PERSONS PER 1,000 EXPOSED—PRINCIPAL GROUPS OF POPULATION SURVEYED IN LEADING CITIES OF MIDDLE AND WESTERN PENNSYLVANIA.

Group of population surveyed.	*No. of persons enumerated.*	*Rate of sickness per 1,000.*
All groups in state	328,051	18
Bituminous coal mining employees	5,428	23
Other persons in bituminous coal mining families	17,439	15
Anthracite coal mining employees	16,230	26
Other persons in anthracite coal mining families	43,721	16
Other persons in state	245,233	17

The number of cases of sickness per 1,000 persons was greatest among anthracite coal mining employees; the next highest sickness-rate was found among bituminous coal mining employees. Members of anthracite coal mining families, other than the miners themselves, showed a rate of 16 per 1,000, which was slightly higher than the sickness-rate among members of bituminous coal mining families, other than the miners themselves. Among other persons in the state, not employed in mining occupations or who were not members of mining families, the sickness-rate was 17 per 1,000. A further development of these sickness statistics according to the precise diseases and conditions observed in the several occupation groups will be published in the final report of the health census of western and middle Pennsylvania.

The sickness-rate was higher among colored than among white persons. In the group of cities as a whole, 21 colored persons were sick for each 1,000 enumerated; the corresponding rate for white persons was 17 per 1,000.

The districts of Pittsburgh, Braddock and Pottsville showed the lowest sickness rates for the survey, 16 per 1,000 canvassed. The New Kensington and Hazleton districts showed a sickness-rate of 17 per 1,000. Wilkes-Barre district had a rate of 18 per 1,000; Johnstown and Shenandoah, 19 per 1,000; Connellsville, 20 per 1,000; McKeesport, Altoona, Scranton and Shamokin, a rate of 21 per 1,000. The highest rate for any section in the state was shown for Uniontown, and the immediate vicinity where the rate was 23 per 1,000. These facts are developed in the following table:

TABLE II.

SICK PERSONS PER 1,000 EXPOSED—PRINCIPAL DISTRICTS OF WESTERN AND MIDDLE PENNSYLVANIA, MARCH 12 TO 24, 1917.

Area.	*Rate per 1,000 exposed.*		
	Total.	*White.*	*Colored.*
Districts* surveyed in (Pennsylvania, total)	18	17	21
Pittsburgh	16	16	18
Braddock	16	16	23
McKeesport	21	20	24
Pottsville	16	16	†
Uniontown	23	22	28
Connellsville	20	19	23
Johnstown	19	18	39
Altoona	21	22	†
Scranton	21	21	†
Shamokin	21	21	†
Wilkes-Barre	18	18	†
New Kensington	17	16	†
Hazleton	17	17	†
Shenandoah	19	19	†

* These districts include the towns and villages immediately adjoining the city specified.
† Insufficient data.

Taking the group of cities in Pennsylvania as a whole, the chief causes of disability registered in the survey were accident and injuries, which accounted for 11 per cent. of the total; rheumatism was next in importance with 8 per cent. of the total and influenza with 7 per cent. of the total cases of sickness registered. Pneumonia was registered in 6 per cent. and tuberculosis in 3 per cent. of the cases. Diseases of the stomach, asthma, diseases of the heart, "colds" and bronchitis each accounted also for about 3 per cent. of the cases of sickness.

On the basis of the sickness-rate shown about seven days per inhabitant of working age are lost each year on account of sickness.

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Health Campaign among Negroes.—In order to combat the unnecessarily high death-rate among negroes, the New York City Department of Health, in coöperation with the National League on Urban Conditions among Negroes conducted an intensive educational campaign in that city during the last two weeks in April. According to the *Weekly Bulletin* of the department for April 7, figures prepared by the director

of the Bureau of Records show that the general death-rate among the colored population is almost double that of New York City at large. Thus, in 1916, out of 77,710 deaths, 2,628 were among the colored population. Inasmuch as the colored population is estimated to be slightly over 107,000 this gives a negro death-rate of 24.4 per 1,000 negroes as compared to the general city death-rate of 13.7 per 1,000 during the same year. It is also well established that the colored babies born in that city have only half the chance of living through the first year that the white babies enjoy. Last year out of every 1,000 white babies born 91 died in the first year; out of every 1,000 negro babies born, 194 died in the first year.

These results are further substantiated by the results published by the U. S. Census Bureau from returns throughout the country, as evidenced by the fact that,

For each white person out of every 1,000 dying of	*There die of each 1,000 colored persons*
All diseases	1.7
Diseases of the heart	1.5
Bright's disease	1.8
Pneumonia	2.0
Typhoid fever	2.2
Tuberculosis	3.2

⚜

State Board of Health Establishes Special Bureau to Direct Rural Health Work.—The Texas State Board of Health has established a new department—a Bureau of Rural Sanitation, whose activities will be devoted entirely to directing, supervising and assisting in conducting the rural health work made possible by the legislature's recent appropriation of $70,000 which is to be supplemented by a like sum from the Rockefeller Foundation through the International Health Board. Dr. P. W. Covington, professor of preventive medicine in the Medical Department of the University of Texas, a physician of long experience in rural health work, has been mutually selected by the agencies concerned as head of this department.

In a recent letter from the State Health Department to the commissioners of counties it was stated that, upon invitation, Doctor Covington would be glad to appear before the county board and personally explain how they may share in the state's appropriation.

The State and the International Health Boards propose to spend from three to six thousand dollars in conducting intensive health work in the rural districts of any county agreeing to employ four local assistants at the rate of $50 per month, each, for a period of not less than four months. These lay assistants to work with a staff of trained sanitarians who will, in the event the proposition is accepted by the county commissioners, conduct the work.

⚜

Wassermann Frauds.—The *New York Medical Journal* for April 7, 1917, contains the following article under this title;

"The Health Department of the City of New York states that a number of unscrupulous physicians in the city, apparently for the most discreditable reasons, have deliberately altered the free Wassermann reports furnished them by the department's laboratory and have exhibited such false reports to their patients, although it was expressly agreed that such reports would be given only to physicians and under no circumstances to the patients. In one case the physician changed a plus minus report to read four plus. In another case four plus was changed to read plus minus, and similar changes were made in reports furnished in still other cases. The department announces that it will take drastic action in the next case of this sort which comes to its attention. No condemnation can be too severe for the physician who would resort to such practices. It would seem incredible that such things could be done, but we have the assurance of the department that the proof is in its hands. The department will have the unanimous support of the physicians of the community in taking the most drastic action against any physician guilty of such contemptible practices."

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Post-Graduate Medical Work Postponed.—On account of the unsettled questions of war, particularly as they affect the medical profession, the North Carolina State Board of Health makes the announcement that the Post-Graduate Medical Instruction Work, which the board and the State University had again planned for the physicians of the state this summer, will be suspended at least for the present time. This has been found advisable in order that physicians might be ready for active service in case of war

and for the reason that the doctors who were to be the instructors of the classes have already pledged their services to their country as members of the Officers' Medical Reserve Corps.

The work of post-graduate medical instruction which was inaugurated a year ago by this State Board of Health and the State University, and which was at that time a new idea in health work, has proved to be a popular and valuable contribution to medical education. Dr. W. S. Rankin, who originated the idea and worked out the plan, has been called to explain this method before the New York State Medical Society, and other states and institutions have favorably considered the plan, the principles of which promise to become widely adopted.

To bring the instructor to the classes rather than the old way of bringing the classes to the instructor at about one sixth of the usual cost was the principle of the new method of medical education. Last summer two courses with two instructors, each having six classes were arranged for and as much or more were the plans for this summer but for the war.

✻

Examinations for Sanitary Supervisors.—The Civil Service Commission of the state of New York announces an open competitive examination for the position of sanitary supervisor under the New York State Department of Health, in order to fill, by July 1, the four vacancies now existing on the list of supervisors. The examination will be held June 9, 1917. Salary, $3,000. Candidates must be physicians, and, when appointed, not less than twenty-eight nor more than fifty years of age. Additional requirements are that candidates must have served as health officer of a city, town or village having a population of at least 5,000 persons for a period of at least four years; shall have received instruction approved by the Public Health Council, with at least two years of experience in public health work, and shall otherwise satisfy the demands of the council. The examination is open to non-residents. All inquiries should be made of the State Civil Service Commission, Albany, New York.

✻

Nuisance Abatement by Court Order.—The Division of Housing and Sanitation of the Philadelphia Department of Health and Charities was recently successful in obtaining an opinion from the Court of Common Pleas of that City, in relation to a bill in equity filed against the Bureau of Health and the appeal of the trustees of the estate of a certain Stephen Smith from an order to abate sanitary violations by the removal of weeds from the Olive Cemetery, Philadelphia.

The rule of the Bureau of Health is that "Weeds, noxious and poisonous plants, docks, tall grass and other offensive vegetable growths, shall not be permitted to attain a height of more than one foot on grounds surrounding dwellings, two-family dwellings, rooming houses, tenement houses or unimproved or unoccupied lands in any portion of the city of Philadelphia laid out in city blocks: provided, that this regulation shall not apply to lands under cultivation with growing crops."

The Division of Housing and Sanitation ordered the abatement of unsanitary conditions by removal of weeds and refuse. The trustees of the cemetery refused to comply with the order on the ground that it was unconstitutional. The court held that "the order of the Bureau of Health was not an arbitrary or oppressive misuse of its discretion in determining the nuisance existed, but from evidence presented in appeal it was justified, and the nuisance should be abated."

The Philadelphia Bureau of Health feels that this decision is most important, not only for the reason that the Health Department is upheld, but that it believes that civic improvement is directly dependent upon civic health, and that the question of vacant land in cities of large population is one that is probably giving considerable bother to many health authorities.

✻

Tuberculosis Returns in Arizona.—The report of the Arizona State Board of Health for the six months from July 1 to December 31, 1916, gives the number of deaths from tuberculosis of all forms as 377, which with the number of deaths reported from this disease for the first six months of the year, namely 484, makes a total for 1916 of 861 deaths, out of 4,149 cases reported. These deaths represent more than 20 per cent. of the total deaths of the state reported for the year, and the Arizona State Board of Health feels that these deaths are of people who have come to the state in a highly diseased condition. Moreover, it will be noticed that the first half

of the year registered considerably more deaths than were registered in the last half of the year, and this condition has existed for several years, as shown by the available figures: 1913, first half, 461; second half, 288; 1914, first half, 511; second half, 354; 1915, first half, 490; second half, 325; 1916, first half, 484; second half, 377. Commenting editorially on this subject, the April *Bulletin of the Arizona State Board of Health* assumes that "this probably results from the fact that people afflicted with tuberculosis are forced to Arizona by the inclement weather of their home states as winter advances. Very many stay at home until there is no hope of recovery. Then they come to Arizona and the helpless cases die in the early months of the year."

✠

The Cow Won.—An official of the Board of Health in a town not far from Boston notified a citizen of the town that his license to keep a cow on his premises had expired. In reply to this letter, the official received the following communication:

"Monsieur Bord of Helt—I jus get your notis that my licens to keep my cow has expire. I wish to inform you, M'sieur Bord of Helt, that my cow she beat you to it,—she expire t'ree week ago. Much oblige. Yours with respeck.

"PETE ———."

Public Health Notes.

Controlling Preventable Diseases in Rural Districts.—Dr. A. Caswell Ellis, writing in the *Texas Medical Journal* for April, 1917, describes a method of intensive rural health work employed in several East Texas counties last year. Particular stress was laid upon malaria, typhoid, hookworm and dysentery, largely because of their wide prevalence in those rural districts; but also because their causes are known and means of prevention well established; and the same measures that protect against one of these diseases protect also against some of the others.

Detailed directions as to how the communities were selected, the necessary funds raised, and how the campaign was carried out, are recorded in this interesting article.

A laboratory was established and the central schoolhouse was used all through the campaign as the place for lectures and other meetings. Every home was visited for the following reasons:

1. To secure the health history of each member of the family for the preceding year;

2. To inspect the premises and offer suggestions for remedying all unsanitary conditions;

3. To disseminate simply written and well-illustrated circulars and bulletins for the purpose of reinforcing and enlarging what the visitor had said;

4. To secure blood smears from each member of the family and to leave containers for samples of feces of each individual;

5. When desired, an appointment was made for a carpenter who was sent to assist in getting screens and privies properly made.

After the laboratory examinations were made, a report was sent to the head of the family and directions for treatment were communicated where necessary.

Doctor Ellis enumerates the following results of the coöperative work:

1. The lasting value of the hookworm work done by the Rockefeller Commission several years ago was made plain;

2. It was shown that even in a short time hookworm infection could be reduced from 25 per cent. to 3 per cent. by voluntary effort, and that almost an entire community could be induced to build sanitary privies without any process of law;

3. That 75 per cent. of the families in these districts that had properly screened homes entirely escaped malaria;

4. It was shown that it was more difficult to induce proper screening than it was to persuade building sanitary privies;

5. The value of the proper use of quinine in treating malaria was demonstrated;

6. The harmlessness of quinine as a prophylactic was clearly proven;

7. The most nearly accurate account yet secured of the actual kinds and amounts of preventable diseases present in the lowland, coastal plain country was obtained.

The article is concluded with a plea for greater efforts and expenditures toward eradicating these diseases.

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Newer Aspects of Infection in Pneumonia.—Edward Steinfield summarizes recent important findings concerning pneumonia in the *New York Medical Journal* for April 14, 1917.

Four types of virulent pneumococci have been isolated. Types I and II each produce a specific anti-serum, while for III and IV no anti-sera have as yet been obtained.

Diagnosis of type is valuable, first, because this shows whether an anti-serum will prove useful and indicates the proper type of serum, and second, because it helps in forming a prognosis. The worst cases of pneumonia are due to types II and III.

Transmission from person to person is believed to be by way of the respiratory tract, especially in the acts of coughing and sneezing. Experiments with rabbits show that exposure to cold is an important predisposing factor.

Infection is essentially a bacteremia and not merely lung involvement. Endotoxins are liberated when the coccus is broken up and digested by phagocytic cells. Agglutenins against types I, II and IV are formed in the blood, but are very transient. Likewise, the acquired active immunity is probably short,—possibly not more than a few weeks.

Recovered patients are known to have carried the virulent organism ninety days, and the author urges detention of recovered patients by public health authorities until the carrier state terminates in a manner similar to typhoid or diphtheria control.

✱

Public Health Training.—G. F. Vincent, Minneapolis (*Journal American Medical Association*, April 7, 1917), says that social demand and academic supply is far from an exact formula. Sometimes courses are offered in universities for careers that depend on other things than institutional preparation; on the other hand, they are often slow to recognize actual vocational needs. Both these tendencies are shown in the effort being made to meet the needs of public health service. It seems clear, Vincent says, that successful public health training must be carried on either by universities or schools in close affiliation with them. Only a well endowed institution can provide for all the training required by a public sanitarium, moreover, the university atmosphere of investigation is favorable and stimulating. The closest coöperation with agencies carrying actual health activities is also of fundamental importance. Excepting the apprenticeship opportunities in public health bureaus, the conscious attempts to provide the necessary training have been made so far by the universities and much has been accomplished. Vincent lists the institutions that have taken this up, including under them the one to be organized at Johns Hopkins University, with the aid of the Rockefeller Foundation. The preliminary requirements and the extent of the courses given are also stated, the usual degree obtained being that of doctors of public health. The variations in the courses of the various institutions are pointed out and the article may be considered as a fair statement, up to date, of the condition of public health instruction in this country. It is worth noting, he says, that in all practical field work is provided for. A few phases of public health work seem to have been overlooked or only incidentally recognized. For example, the application of public health publicity is one deserving of careful study and for which special types of training should be provided. A few individuals have shown conspicuously how much can be accomplished by wise methods of education and publicity. Vincent also enumerates the various types of public health officers that are required: men specially skilled for public health administration; laboratory men; administrative specialists; sanitary engineers; school medical officers who are more than practitioners and see the health of the school in its relations to community life, on the one hand, and individual efficiency, on the other; specialists in public health education and publicity; public health nurses for city and country; sanitary inspectors of many kinds; and probably other types yet to be added to the list. The sanitary engineer is a specialist in his particular line and not fitted for the responsible head of a municipal or state public health organization, as is sometimes supposed. The condition for admission to a public health course will require careful consideration. There is an advantage in requiring a degree in medicine from a first

class college but there is danger that a physician will give too much time to unnecessary medical and surgical details. It is altogether likely, Vincent says, that requirements should be modified for the student, after his first two years of a medical course, to substitute a considerable amount of public health work for the clinical courses of the regular medical curriculum of the following two years, but it is undesirable for the man seeking the highest position in preventive medicine to have less than the equivalent to a four year medical course with two years of graduate work. For the several groups of public health workers, different requirements will probably be prescribed and it is conceivable that the curriculums may vary in length from two or four to eight years beyond graduation from high school. These matters will probably be worked out satisfactorily in time. The social sciences will receive more emphasis. The history of public health work, the problems of poverty and dealing with dependent and delinquent groups will be given closer attention. He mentions, also, the possibility of affording the students support by work as subordinates in public health work and by the establishment of fellowships. The outlook for public health in the United States, he thinks, is encouraging. It seems clear that not every medical school can provide a full course of public health training and Vincent thinks it desirable that a few centers be recognized and given support for the higher types of training. "The standards and ideals should be set by a few institutions which have the resources which will enable them to establish genuine schools, well equipped, properly manned, dominated by authoritative leaders, inspired by the public health point of view, and working in close fruitful relations with the public health agencies of the community, the state and the nation."

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Humor in Death Certificates.—Those who accuse the Englishman of lacking a funny-bone must except the editor of the *Medical Officer*, from whose columns we take the following:

"The following curious causes of death are stated by the North Carolina Board of Health to have been certified at various times to registrars in that state: 'Went to bed feeling well, but woke up dead.' 'Died suddenly at the age of 103. To this time he bid fair to reach a ripe old age.' 'Do not know cause of death, but patient fully recovered from last illness.' 'Deceased had never been fatally sick.' A mother 'died in infancy.' 'Died suddenly, nothing serious.' 'Pulmonary hemorrhage—sudden death. (Duration four years.)' 'Kick by horse shod on left kidney.' 'Don't no. Died without the aid of a physician.' 'Deceased died from blood-poison, caused by a broken ankle, which is remarkable, as his automobile struck him between the lamp and the radiator.' 'Blow on head with ax. *Contributory cause*—Another man's wife.'"

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Tuberculosis, a Disease of Children.—This is the title of an interesting article by Dr. F. Clifton Moor, appearing in the *Southern Medical Journal* for April, 1917.

Doctor Moor says that the points to be stressed are ample protection for all children under five, and prevention of the massive infection, which is sure to occur when there is active disease in either parent or some other member of the household. No mother with active disease should nurse her infant, and she and others of the household should be taught in detail by precept and example all the precautions necessary.

In a certain percentage of the families, where ignorance and poverty or a bed-ridden mother make home conditions hopeless, there is nothing to be considered except the removal of the younger children to a "preventorium," the establishment of which is one of the first problems that confronts us.

Another less important requirement in preventing infection is the control of bovine tuberculosis. This can be done only by uniform state laws or, better still, by the Federal Government. Work along this line has recently been instituted in Doctor Moor's own state, South Carolina. Beginning in 1914 with two nurses for the whole state, the number has been increased to thirteen, twelve of whom are assigned to definite districts. Previous to the establishment of this plan there were practically no cases reported to the board of health. During the first year of the present campaign 1,225 patients were seen by the visiting nurses, and up to September, 1916, 2,781 patients were or had been visited and instructed in the principles of prevention. The average time between visits is four weeks, and the nurses

report that the great majority of families visited are interested and really endeavor to follow instructions.

Pedal Hygiene.—The *Boston Medical and Surgical Journal* of April 12, 1917, contains an editorial entitled, "The Modern Tendency Toward Weak-Foot."

Present day civilization, it is stated, has brought in its train a condition of foot-atrophy from disuse. The increasing tendency to weak-foot is rendered obvious through the greater and greater demands for orthopedic aids to walking. Usually, however, these orthopedic aids in the incipient stages of weak-foot may do a great deal of harm. They still further rob the muscles of their rightful function of support. The indiscriminate use of artificial supports, usually arched quite beyond the normal and purposed for a sort of pseudo-overcorrection, is to be discouraged whenever possible.

Proper foot exercises to strengthen the offending muscles are most important for the relief of weakness in either arch.

Bad walking habits and bad fitting shoes constitute very great factors in the development of weak-foot. The normal foot is in a straight line from great toe to heel and maintained perpendicular to the midline of the body. Shoes must be built on the lines of the normal foot.

In conclusion the author writes:

"Only a timely and vigorous campaign of education in the matter of proper footwear, foot habits, and foot exercises such as marches, hikes and systematic foot calisthenics, can save us from becoming creatures who are neither four-footed nor yet twofooted, and certainly not sure footed."

The Widal Reaction as a Diagnostic Aid.—The *Medical Officer* for March 10, 1917, prints the following:

"The Royal Health Department of the Kingdom of Saxony has issued the following dicta regarding the diagnostic value of the Widal reaction and the determination of the typhoid bacillus in the blood and feces: 1. The Widal reaction is not specific in the detection of typhoid. It is merely an aid and should be considered only in connection with the clinical history and the nature and degree of the reaction. 2. It may be regarded as positive only in the second week of the disease. 3. A negative Widal should not influence the diagnosis when typhoid is suspected. In such cases the test should be repeated. 4. A positive reaction with a serum dilution of 1.80 is of great value, but it must be remembered that the patient may have had typhoid before, and that in rare instances other diseases, especially jaundice, may give a positive Widal. 5. In the case of individuals who have received a prophylactic typhoid vaccination, the reaction may be positive for from three to five months afterwards. 6. A positive diagnosis of typhoid may be made on finding the typhoid bacillus in the blood of persons who have not received a prophylactic injection during the first week of the disease, and later in the blood of vaccinated persons. Material for such examinations is furnished by the authorities. 7. Typhoid bacilli will be found in the feces usually only in cases in which intestinal ulcers have formed, that is, not earlier than the end of the second week of the disease. It is to be noted that typhoid bacilli have been found in the stools of typhoid carriers."

The Classification of Pulmonary Tuberculosis.—The classification of pulmonary tuberculosis from before the time of Bayle up to the present day concluding with the classification of the National Association for the Study and Prevention of Tuberculosis, now in general use in this country, and the rearrangement as worked out at Otisville in 1910 and adopted by the Sanatorium Association in 1916 are discussed by Walter L. Rathbun in the first number of the *American Review of Tuberculosis*. The National Association Classification recognizes four groups of cases: "Incipient," "Moderately Advanced," "Far Advanced," and "Acute Miliary Tuberculosis." The rearrangement adopted by the Sanatorium Association uses the above grouping to describe the anatomic lesions in a given case and adds a further qualifying classification of symptoms into "A, slight or none," "B, moderate," and "C, severe," any one of which may describe a case that falls anatomically into any of the four main groups.

These combinations are interpreted as follows:

LESIONS.	SYMPTOMS.
Incipient. Slight infiltration limited to the apex of one or both lungs, or a small part of one lobe. No tuberculous complications.	A. (Slight or None.) Slight or no constitutional symptoms, including particularly gastric or intestinal disturbance, or rapid loss of weight; slight or no elevation of temperature or acceleration of pulse at any time during the twenty-four hours. Expectoration usually small in amount or absent. Tubercle bacilli may be present or absent.
Moderately Advanced. Marked infiltration, more extensive than under incipient, with little or no evidence of cavity formation. No serious tuberculous complications.	B. (Moderate.) No marked impairment of function, either local or constitutional.
Far Advanced. Extensive localized infiltration or consolidation in one or more lobes. Or disseminated areas of cavity formation. Or serious tuberculous complications.	C. (Severe.) Marked impairment of function, local and constitutional.
Acute Generalized Miliary Tuberculosis.	

This scheme offers the following combinations:

Incipient	A.	Moderately Advanced	A.		
"	B.	"	"	B.	
"	C.	"	"	C.	
		Far Advanced	A.		
		"	"	B.	
		"	"	C.	

The rearrangement unquestionably greatly increases the flexibility of the classification without appreciably modifying the original text.

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Typhus Fever.—P. K. Olitsky, B. S. Denzer and C. E. Husk, New York (*Journal American Medical Association*, April 21, 1917), after reviewing the work that has been done in regard to the body lice infection of typhus, give an account of their own experimental work in producing typhus fever in guinea-pigs by the intraperitoneal injection of infected lice, and studying it bacteriologically. They ground up lice, feeding on typhus fever patients, in a sterile mortar with about 4 cc. of saline solution, making a homogeneous suspension which was injected into guinea-pigs. After bleeding the animals, their defibrinated blood was injected into other guinea-pigs. The unsettled political conditions, however, interrupted the work so that the transmission of the virus could not be followed up completely to its termination. The necropsy on the original guinea-pig, however, showed the typical lesions of typhus fever and emulsions made from the spleen of the animal and cultivated anærobically gave, on culture, typical colonies of the typhus bacillus. The guinea-pig injected similarly with a like emulsion from lice taken from a subject of Brill's disease in New York showed no such reactions. In this case, they consider the evidence conclusive, however, that typhus fever can be transmitted to guinea-pigs by injection of typhus-infected lice and the typhus bacillus has been recovered from the spleen of the reacting animal. They emphasize the point that contamination of such cultures did not occur as might have been expected. When the intestinal contents of typhus-infected lice virulent from guinea-pigs were cultivated, pure cultures from the typhus bacillus often resulted. They notice the claims of da Rocha-Lima as to the specific distinctness of the bacillus obtained by him from typhus patients, and as evidence of this, his offering the variability of the gram-stained reaction in the organism described by him. They find that both gram-positive and gram-negative organisms have been often met with in the original colonies, as shown in their own experience and from those of Plotz and Baehr, and the constancy of a positive or negative-gram stain is not important. One factor should be noted, however, the relationship between the decolorization by Gram's method and the virulence of the organism. In conclusion, they say: "Since 1910, many observers in different parts of the world have reported the finding of an organism in typhus-infected lice. This organism they believe to have a casual relationship to typhus fever. Owing to the fact that improper methods have been used, culture of this organism was impossible. In Mexico, we have been able to grow this bacterium and to show that morphologically, culturally and serologically it is identical with the *Bacillus typhi-exanthematici*."

Industrial Hygiene and Sanitation.

Asphyxiation from Blast-Furnace Gas is the title of Technical Paper 106, Bureau of Mines, Department of the Interior, written by Frederick H. Willcox.

This report is issued by the Bureau of Mines in pursuance of its endeavors to increase safety and efficiency in metallurgical industries. It discusses the nature and causes of poisoning from blast-furnace gas, itemizes the places where gas may be expected to be encountered, suggests safeguards and points out the precautions to be taken in working about gaseous places.

Blast-furnace gas is peculiar in that it is very poisonous and under certain conditions, as when it has been cleaned, is without color or odor by which it may be detected. Gas is practically always present about the top and bottom of the furnaces, frequently in such small proportion that it is not evident to the physical senses, but at the same time in sufficient volume to cause asphyxiation if breathed for twenty or thirty minutes. Proportions sufficient to cause asphyxiation or gassing also occur with more or less frequency all along the route of the gas, at the stoves and boilers when they are taken off for cleaning or repairs, inside of gas mains, down comers, and other parts of the gas-main system, at sand or goggle valves, and during repairs to the charging equipment and stock line. The increasing application of furnace gas to gas-driven blowers and generators has introduced additional equipment such as tower washers, fans, and other cleaning devices that also must be entered from time to time for cleaning and repairs. At all the above places there is always the possibility that gas may be present where the crews have to work, either from leakage, insufficient ventilation, or from emission of gas retained in the brickwork, flue dust, or deposits in the apparatus. Though poisoning by blast-furnace gas usually results in nothing more serious than illness and severe headache, it may cause unconsciousness and even death, and realization of the dangers and a strict observance of every precaution is essential in undertaking any work in an atmosphere contaminated by furnace gas, or in sending men into confined places, from which it would be difficult to escape, in proximity to material emitting gas or difficult to ventilate.

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Dearth of Anti-Anthrax Legislation in United States.—During the closing months of 1915 and the early part of 1916 there was a sudden and startling increase in anthrax morbidity and mortality in the United States, particularly in New York, Massachusetts, and Pennsylvania. The relative importance of anthrax is shown by the fact that for every five deaths from lead poisoning reported in the United States Registration Area there is one death from anthrax. In Europe both private and public forces have combined to carry on an energetic campaign against industrial anthrax. The Anthrax Investigation Board of Bradford and District, in England, the German and French employers' mutual trade associations, and the famous labor clinic at Milan, Italy, have all made valuable studies of the disease and assisted in establishing preventive measures. The governments of the leading countries long ago drafted and secured the careful enforcement of sanitary rules for the dangerous industries, and researches in efficient and practical methods of disinfection are still under way. In the field of prevention, especially, the United States lags behind. Anti-anthrax serum is scarce and not readily available. No specific regulations for safeguarding workmen from the disease have yet been enacted by any state. Two states authorize workmen's compensation for all anthrax contracted in the course of employment. The entire subject is exhaustively and admirably treated by Dr. John B. Andrews in *Bulletin 205* of the United States Bureau of Labor Statistics.

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Boiler Explosions are from five to seven times more numerous in the United States than in England and from twenty to thirty-five times more numerous than in Germany, according to a recent statement by Dr. F. S. Crum, assistant statistician for the Prudential Life Insurance Company. That the consequent loss of life can be materially decreased by a competent inspec-

tion service is shown, he states, by the fact that the number of explosions of locomotive boilers was decreased 54 per cent. with a saving of life of 87 per cent. as the result of inspection required for locomotives engaged in interstate commerce. From *Safety Engineering* for March.

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The Committee of the National Association of Manufacturers, hitherto known as the Committee on Workmen's Compensation and Accident Prevention, is now called the Committee on Health and Safety. The change has been made for the reason that the word "accident" automatically limited the scope of effort to accident prevention solely. It is recognized that occupational disease prevention and fire prevention are as essential as is accident prevention.

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One of the Reasons of the Slow Progress of health insurance legislation in this country is that the subject requires deep study to be intelligently discussed. This being the case, it is not surprising that many people have a fixed opinion not at all based on the actual facts. Those who want to be fully informed of the present state of the intricate problem of health insurance here and abroad can do no better than read Dr. F. L. Hoffman's excellent address entitled "Facts and Fallacies of Compulsory Health Insurance." The address was presented before the Section on Social and Economic Science of the American Association for the Advancement of Science, December 28, 1916.

✱

Breathing Apparatus Tests.—A pamphlet has been published by the U. S. Bureau of Mines (*Technical Paper 82*) which contains authoritative information regarding the relative merits of different types of breathing apparatus and the defects of all types now in use. The authors of the publication are Yandell, Henderson, and James W. Paul. The report has for its purpose to show the inherent limitations of present types of oxygen breathing apparatus, to indicate improvements in design, to explain how by relatively slight changes of adjustment the present types may be made more efficient, and to present the results of practical tests. The authors have coöperated from the points of view of the physiologist and the engineer. The results of the tests with the present types of apparatus in the smoke room, in the open air, and in mine rescue work and maneuvers demonstrate the necessity of training in accordance with a definite schedule of work. Until improved types of apparatus are made in which the temperature of the impure air is under better control, the carbon dioxide of the breath absorbed with greater efficiency, and a visible amount of oxygen automatically supplied, present types of oxygen rescue apparatus must be used, in spite of their limitations. The Bureau of Mines has attempted to develop an apparatus along the physiological lines for which it calls. Mr. Gibbs of the Bureau has produced an apparatus which, in experimental tests, has shown itself superior to the older types, but which has still to be subjected to further tests in service. Its principal features have been patented for the Bureau of Mines, and, if finally successful, will be made available for general use.

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Approximately Four Times as many people are employed in the factories of New York state as are employed in building and construction work. Yet during the four years from October 1, 1910, to September 30, 1914, according to *Special Bulletin No. 80*, State of New York, Department of Labor, more fatalities due to accidents occurred in building and construction work than in factories. The numbers were: building and construction work, 1,641; and factories, 1,285. Fall of person caused more fatalities than any other single cause. Undoubtedly many accidents are traceable to ignorance, carelessness or indifference of the workmen rather than to defects in materials or construction.

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The Report of the Social Insurance Commission of California to the legislature of 1917 is a sweeping endorsement of practically the whole program of social insurance—health, unemployment, old age, invalidity—as "a practical and effective means of counteracting at least some of the harmful results of modern industrial conditions upon the well-being of the wage earners." Compulsory health insurance is urged as the most logical first step in such a program. The April issue of the *Monthly Review of the United States Bureau of Labor Statistics* contains a synopsis of the report.

A Threefold Plan of Social Insurance, embracing service pensions, compensations for accidents and health insurance, has been put into operation by F. C. Huyck & Sons, woolen manufacturers, Albany, N. Y., for the benefit of its employees numbering approximately 400. The employees contribute 1 per cent. of their wages to the fund. Details of the plan are available in the April issue of the *Monthly Review of the United States Bureau of Labor Statistics.* The company appears to be well satisfied with the operation of the plan and feels that the expense has been amply justified by the results achieved.

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Coal Mine Control in England.—According to an announcement in the British *Board of Trade Labour Gazette* for February, 1917, the government has decided that the board of trade shall take possession of all the coal mines in the United Kingdom for the period of the war, in addition to those in South Wales which have already been taken over under the Defense of the Realm Act. The president of the board of trade has decided to set up a new department, which will control the coal mines and will also exercise the other powers and duties of the board of trade with regard to coal.

*

General Requirements for Sanitary Installations have been prepared by the Sanitary Committee of the United States Steel Corporation. The information published by the Sanitation Committee is to be used as a guide in standardizing sanitary equipment in order to ensure the provision of efficient sanitary facilities and proper sanitary conditions at the time construction work is planned. All legal requirements, such as local building codes, city ordinances, plumbing regulations, etc., must of course be observed. Details of the regulations appear in the March *Safety Engineering.*

*

A Decision Recently Arrived at by the Industrial Board of Indiana may have the effect of reducing the number of eye accidents in the industries due to carelessness or negligence on the part of the worker. The defendent company provided proper goggles and instructions to the effect that these must be worn. The plaintiff disregarded instructions and was subsequently injured around the eyes. The Industrial Accident Board ruled that the plaintiff was not entitled to an award.

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The Greater Part of the Splendid Educational Exhibit of the Aetna Life, Accident and Liability Companies in the Palace of Mines at the Panama Pacific Exposition during 1915, has now been set up at the American Museum of Safety in New York City. A brief description of the exhibit contained in *Safety* for March.

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The Nashville, Chattanooga and St. Louis Railroad is fitting out a "Safety First" car. It is planned to run the car over the road, making stops at all points to deliver illustrated talks on the safety work and its objects, and in this manner secure the active coöperation of the public generally.

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The Fourth National Exposition of Safety and Sanitation will be held at the Grand Central Palace, New York City, during the week of September 10, 1917.

*

Up to January 1st the California Railway Commission inspected about 2,000 grade crossings. About 8,000 remain to be inspected. The cost to the commission has been approximately $2.40 for each crossing.

*

The Administration of Child Labor Laws in New York State is very exhaustively treated in a publication of the U. S. Department of Labor, Children's Bureau (*Industrial Series, No. 2, Part 2*). The authors are Helen L. Sumner and Ethel E. Hanks.

Communications.

To the Editor:

In as much as the very valuable report of the Commission on Milk Standards of the N. Y. Milk Committee, published in the U. S. Public Health Reports for February 16, will be generally accepted by those interested in the milk question as an accurate summary of the development of the grading system, it seems unfortunate that in enumerating the cities where the plan has been taken up no mention is made of Chicago.

This omission is all the more singular because it happens that Chicago legislation on grading milk anticipated by more than four years the position recently reached by the Commission.

Summarizing briefly, the findings of the commission are that there should be three grades of milk:

(A) Produced, transported and sold under conditions which justify its sale unpasteurized. The cows from which it comes to be annually both tuberculin tested and physically examined.

(B) Milk from cows shown to be free from disease by an annual physical examination and produced, transported and handled under such conditions that the count will not go over 1,000,000. All milk of this grade to be pasteurized.

(C) Milk of such inferior grade that "Recognition of this grade of milk is not recommended by this commission except in communities in which such recognition is an economic necessity."

In other words that permitting sale of C grade milk at all should not be a matter of choice but of necessity.

The Commission furthermore finds that:

1. Bacterial standards have to be adjusted to local conditions and should if possible be progressive.

2. That the records of the recording thermometers on pasteurizers should be examined not less than once a month, but suggested no plan for avoiding fraud.

3. That the permit or license to producer of dealer should be for a specific grade of milk, to be stated on label.

4. That in dating labels uniform methods should be adopted.

5. That the efficiency of pasteurization be controlled by bacterial tests before and after treating.

6. That in making the bacterial count the standard methods of the American Public Health Association. Laboratory Section, should be employed.

Taking up the above mentioned matters *seriatim*, it appears that in Chicago milk was divided into the following grades:

(A) The first—obtained from tested animals, and permitted to be sold without pasteurization, and with a count of not over 150,000 in winter and 200,000 in summer.

(B) The second—obtained from cows physically examined and with a bacterial count, before pasteurization, of not over 750,000 in winter and 1,000,000 in summer.

(C) That no inferior grade was recognized.

And it further appears—

1. That bacterial standards were adjusted to local conditions and were in effect made progressive by the provisions raising the standard of farm scoring, lowering the temperature required and raising the standard of pasteurization at certain future dates.

2. That pasteurizers had to have recording thermometers under the control of the Health Department.

3. That the permit or license was for a specific grade and it was required to be plainly stated on the label or cap.

4. That uniform methods were prescribed for dating labels of all grades.

5. That provision was made for standardizing the operation of each pasteurizer on the basis of bacterial efficiency as shown by count before and after process.

6. That the methods prescribed in making tests were those recommended by the American Public Health Association.

The ordinance containing the above provisions was passed August 14, 1912,—so long ago that the commission probably forgot it when preparing in 1916 to make its latest recommendations.

The matter of course is only of interest to those concerned with the accuracy of sanitary history and to the authors of the Chicago ordinance, Assistant Health Commissioner Godfried Koehler, and the writer.

Very truly yours,

G. B. Young,

Late Commissioner of Health of Chicago.

Personal Notes.

Friends of public health advancement will regret to hear of the resignation of Dr. Ernest C. Levy as chief health officer of the city of Richmond, Va. Doctor Levy has worked for many years in an earnest endeavor to improve the health conditions of the city and has been instrumental in bringing about the many improvements accomplished. Space does not permit us to enumerate the results and achievements accomplished by the Richmond Health Department under his directorship. Suffice it to say that the annual reports of Doctor Levy were eagerly watched for by health workers and in a sense constituted a text-book for advanced public health practice and thought. Last year Doctor Levy explained that he would resign from his health officership unless the city granted the increased appropriation for health work recommended by him, being unwilling to continue in a position where he was unable to get a little nearer giving Richmond the kind of a health department she was entitled to, besides enabling him to satisfy his own sense of what the city should have. In spite of this, the increase in the appropriation was not granted, owing very largely to the great opposition on the part of the newspapers on the plea of economy. In this way Richmond loses the services of one of the foremost health officers in the country, and only too clearly brings before us the necessity of the creation of the public conscience, so that instead of a slight monetary gain it will be possible to make predominant confidence in health work and realization as to its necessity. Doctor Levy has joined the staff of the North Public Health Bureau of New York City. He is to be succeeded by Dr. Roy K. Flannagan.

✻

Dr. William A. Evans, president of the American Public Health Association, has been appointed chairman of the sub-committee on sanitation of the Committee of National Defense.

✻

The Women's Medical Association of New York City is planning a banquet to be held at the Hotel McAlpin on Wednesday evening, June 6, 1917, for the women physicians who will be in New York for the meetings of the American Medical Association. Tickets, $3, may be obtained from Dr. Matilda K. Wallin, 616 Madison Avenue, New York City.

✻

The University of Pennsylvania announces that two fellowships, the Thomas A. Scott and George B. Wood fellowships, will be vacant in the Laboratory of Hygiene of this University for the session 1917–1918. These fellowships are designed to train and develop investigators and teachers in the field of public hygiene. All inquiries should be addressed to Dr. A. C. Abbott, director, Laboratory of Hygiene, University of Pennsylvania, Philadelphia.

✻

It is reported that in view of the growing scarcity of salvarsan brought about by war conditions, the holders of the American patents on these products are permitting Dr. J. F. Schamberg of the Dermatological Research Laboratories of Philadelphia to supply arsenobenzol.

✻

The trustees of the Atlanta University have, through Edward T. Ware, offered to place the university buildings and grounds, in case of need, at the disposal of the United States Government, hoping that they can in some way be used to prevent or relieve the hardships attendant upon warfare, especially as they may effect the negro people.

✻

Mr. Curtis E. Lakeman, executive secretary of the American Society for the Control of Cancer, and Dr. William F. Snow, general secretary of the American Social Hygiene Association, are temporarily detailed to administrative work in the medical section of the Council of National Defense at Washington, D. C.

✻

Mr. J. W. Magruder, secretary of the Baltimore Federated Charities, has been appointed an associate of Ernest P. Bicknell, director of civilian relief of the American Red Cross, with headquarters at Washington, D. C.

Charlotte Rumbold has been appointed to the staff of the Cleveland Chamber of Commerce as an assistant secretary working with the committees on city planning, housing, sanitation and public recreation.

✻

Mr. George H. Craze, formerly with the National Housing Association, has been appointed assistant to the chief of the Bureau of Housing of the Pennsylvania State Department of Health.

✻

Dr. Linsly R. Williams, now deputy commissioner of the New York State Department of Health, has been appointed first deputy to the New York City Department of Health.

✻

Dr. Richard M. Olin has been elected to succeed Dr. John L. Burkart, resigned, as secretary of the Michigan State Board of Health.

✻

Dr. Arthur K. Bennett has been appointed to succeed Dr. R. C. Main, resigned, as health officer of Marquette, Mich.

✻

Dr. James W. Inches, formerly mayor of St. Clair, Mich., has been appointed health officer of Detroit, Mich., until July 1, to fill out the term of former health officer, Dr. William H Price, resigned.

✻

Governor Lowden of Illinois has announced the appointment of five members of his cabinet provided under the Consolidation Bill, among whom Dr. C. St. Clair has been appointed director of the Department of Public Health.

✻

Dr. Jacob C. Geiger, recently chief bacteriologist of the California State Hygienic Laboratory, and assistant director of the Bureau of Communicable Diseases of the State Department of Health, has resigned from that position to enter the United States Public Health Service.

✻

Dr. Mitchell O. DeVaney has been appointed health commissioner of the city of Indianapolis, succeeding Dr. Jay D. Nusbaum.

✻

The following persons were elected to membership in the American Public Health Association, April 20, 1917:

John L. Faulkner, Lynchburg, Va., Bacteriologist and Assistant Health Officer.

H. W. Nowell, M. D., Boston, Mass., Pathologist and Bacteriologist, Massachusetts Homeopathic Hospital 1911–14.

J. M. Moseley, M. D., Arcadia, La., Member State Board of Health.

T. T. Tarlton, M. D., Grand Coteau, La., Member of State Board of Health.

J. T. Abshire, M. D., Le Roy, La., Member State Board of Health.

Thomas A. Roy, M. D., Mansura, La., Member State Board of Health.

L. C. Chamberlain, M. D., New Orleans, La., Member of State Board of Health.

Ruth O. Pierson, Wellesley Hills, Mass., Bacteriologist.

A. D. Hiller, Boston, Mass., Assistant Editor, AMERICAN JOURNAL OF PUBLIC HEALTH.

Arch M. Mandel, Detroit, Mich., Assistant Director, Detroit Bureau of Governmental Research.

T. B. Beatty, M. D., Salt Lake City, Utah, State Health Commissioner.

W. Thurber Fales, Boston, Mass., Student at M. I. T.

Current Public Health Literature.

AMERICAN.

American Food Journal, Chicago.

XII. April.

The Food Situation of the Country. D. F. Houston.
The Food Manufacturer and the Law. Lannen and Hickey.
What Is Diseased Meat? C. W. Stiles.
The Manufacturer of Bread. By the Editor.
Fermentation in the Production of Bread. George L. Teller.
Laboratory Control in Bread Making. H. V. Cadwell.
Care of Confectionery. W. C. Hughes.

American Journal of Diseases of Children, Chicago.

13. April.

Epidemiology of Bacillary Dysentery. W. G. Smiley.
Review of Recent Literature on Conditions of Abnormal Metabolism in Infants. J. L. Gamble.

Boston Medical and Surgical Journal.

CLXXVI. April 5.

History of Medicine and Its Contributions to Science. Major Chamberland.

April 12.

On Disease Incidence in China. C. A. Hedblom.
The Cause of Poliomyelitis. Horace Greeley.

April 19.

A Point Scale for the Measurement of Intelligence in Adolescent and Adult Individuals. R. M. Yerkes.
A Trained Nurse. G. Torrance.

Bulletin of the Johns Hopkins Hospital, Baltimore.

XXVIII. April.

The Recent Epidemic of Infantile Paralysis. Haven Emerson.

Journal of the American Medical Association, Chicago.

LXVIII. April 7.

Public Health Training in Universities. G. E. Vincent.
The After-Care of Infantile Paralysis. R. W. Lovett.
The Nutritional Value of the Banana. Meyers and Rose.
The Cultivation of a Micrococcus from the Blood in Pre-Eruptive and Eruptive Stages of Measles. Ruth Tunnicliff.

April 14.

The Bacteriology of Foods. E. O. Jordan.
Diphtheria in a School for the Deaf and Dumb: Report of an Outbreak. W. D. Stivall.
The Provocation of the Luetin Test in Nonsyphilitic Patients. Cole and Paryzek.
A "Luetin" Reaction in Syphilis Produced by Agar, with a Brief Consideration of Its Mechanism. J. H. Stokes.

April 21.

Acute Poliomyelitis. George Draper.
Use of Thymol in Treatment of Hookworm Disease. B. E. Washburn.
An Epidemic Resulting from the Contamination of Ice Cream by a Typhoid Carrier. J. G. Cumming.
The Isolation of the Bacillus Typhi-Exanthematici from the Body Louse. Olitsky, Denzer, and Husk.

Journal of Bacteriology, Baltimore.

II. March.

A Study of the Diphtheroid Group of Organisms with Special Reference to their Relation to the Streptococci: I. Characteristics of a Peculiar Pleomorphic Diphtheroid. R. R. Mellon.
The Colorimetric Determination of Hydrogen Ion Concentration and Its Applications in Bacteriology. Clark and Lubs.
Soil Flora Studies. H. J. Conn.
Studies in the Nomenclature and Classification of the Bacteria: II, The Primary Subdivisions of the Schizomycetes. R. E. Buchanan.
The Evolution and Relationship of the Great Groups of Bacteria. I. J. Kligler.
A Study of Five Members of the Septicemia Hemorrhagica Group of Organisms with Special Reference to Their Action on Carbohydrates. A. M. Besemer.
Large Numbers of Bact. Abortus Var. Lipolticus Which May Be Found in Milk. Alice C. Evans.
Creatinine Production in B. Coli and B. Typhi. H. J. Sears.

Journal of Laboratory and Clinical Medicine, St. Louis.

II. April.

A Preliminary Medical Study of the Positive Cases Found in the First Year's Work of the Michigan Tuberculosis Survey. V. C. Vaughan.
Spirochaetes. Hideyo Noguchi.
Use of Fehling's Solution in the Determination of Blood Sugar. H. McGuigan.
Clarification of Complement in Relation to Its Preservation. N. E. Williamson.

Journal of the Outdoor Life, New York.

XIV. April.

How Connecticut Beat the Devil. A Fable. S. J. Maher.
Women's Clubs and Tuberculosis. Otto R. Eichel.
Relation of the Sanatorium and the Patient. J. S. Ford.
Settlement Laws as an Element in the Solution of the Problem of the Migratory Consumptive. Gertrude Vaile.

Medical Reviews of Reviews, New York.

23. April.

Focal Infection in Orthopedic Practice. A. Cohn.
The Increasing Menace of the Conventional Shoe. J. Grossman.
On the Reporting of Venereal Infections. H. Crutcher.
Why I Believe in Active Principle of Therapeutics. J. M. French.
Alcoholism as a Public Health Question. G. W. Robinson.

Medical Times, New York.

XLV. April.

Preventive Medicine and Birth Control. S. A. Knopf.
Some Practical, Religious, and Sociological Aspects of Child Adoption. B. B. Brown.
Grippe and Colds. I. W. Voorhees.
Are Municipal Hospitals Unwilling Aids to Abortionists? J. C. Murphy.
Open Air Schools and the Moral to be Inferred Therefrom.

Military Surgeon, Washington, D. C.

XL. April.

Mental and Physical Activity with Reference to Nutrition and Blood Pressure. R. G. Heiner.
Civil Physicians and National Defense. H. Page.
Present Status of Artificially Treated Drinking Water in the Field. William Lyster.
Physical Examination of Large Bodies of Men. Charles Willcox.
Occurrence of Endamebic Dysentery, etc. C. F. Craig.

Modern Hospital, St. Louis.

VIII. April.

Model Hospital Established and Managed by Chinese. Wu Lien-teh.
Hospital Work in the Island of Porto Rico. E. R. Hildreth.
Skim-Milk as Food. J. P. Street.
Standardization of Hospitals—Introduction and Classification. J. A. Hornsby.
Hospital Organization in Rural Pennsylvania. H. L. Foss.

New York Medical Journal.

CV. April 7.

Modern Conception of Inebriety. M. S. Gregory.
The Mentality of the Alcoholic. S. E. Jelliffe.

April 14.

Newer Aspects of Infection in Pneumonia. E. Steinfield.
Administrative Control of Sick Indigents. C. Barker.
More Light on the After-treatment of Poliomyelitis. A. C. Geyser.

April 21.

The Four Plus Wassermann. D. M. Kaplan.
Drug Addiction and the Harrison Antinarcotic Law. J. C. Densten.
The Place of the Psychiatric Clinic in a Prison System. B. Glueck.

April 28.

Pneumococcic Peritonitis in Infancy and Childhood. I. A. Abt.
Channels of Infection and Methods of Transmission of Tuberculosis. W. H. Park.

Value of Early Vaccine Treatment of Pneumonia. G. H. Sherman.
A Municipal Birth Control Clinic. M. H. Kahn.
The Nature of Resistance to Tuberculosis. A. K. Krause.
Dietetic Fads and Fancies. J. E. Lind.

New York State Journal of Medicine.

17. April.

Health Center Field Work. A. C. Schaefer.
Economic Foundations for Health. B. C. March.
Importance of Diagnosis to Vital Statistics with Special Reference to Cancer. J. S. Lewis.

New Orleans Medical and Surgical Journal.

69. April.

Hookworm Investigation in the Antimony Mines, Sinhwa, Hunan Province, China. W. S. Chow.
Eighteen Months' Observations on the Mental and Physical State of Children Following the Removal of Tonsils and Adenoids. C. J. Bloom.

Public Health Journal, Toronto.

VIII. March.

Value of Milk Depots. Jules Tessier.
Meningococcus Meningitis. J. T. Fitzgerald.
Modern Conception of Fumigation after Communicable Disease. F. Adams.
Economic Value of Preventive Medicine. J. O. McCarty.

April.

The Problem of Illegitimacy—The General Practitioner's Point of View. W. F. Clark.
Illegitimacy—The Attitude of the Social Worker. Miss M. J. Kniseley.
The Nurse Midwife. F. J. Taussig.
Survey of the Spreading Health Insurance Movement. I. M. Rubinow.
Principles of Sewage Treatment. J. R. Ellis.
Infantile Increase and Child Conservation. H. B. Weston.

Public Health Nurse Quarterly, Baltimore.

IX. April.

The Public Health Nurse and the Social Worker. Mary S. Gardner.
Community Responsibility for the Dependent Child. H. L. Leete.
Contagious Diseases—A Résumé of Public Health Nursing and Preventive Measures. Charlotte Ludwig.
Caring for Contagious Cases in District I, Cleveland. Pearl Kamerer.
Public Health Nursing and Its Administration: Municipal and Private Control. Mary Beard.
Work of the Social Service Department of a Large Manufacturing Company. Gertrude Kinzer.
School Nursing in a Small Town. Amy F. Lowe.

Psychological Clinic, Philadelphia.

XI. April.

A Picture Arrangement Test. A. C. Bowler.
The Feeble-Minded in the State of Missouri. J. E. Wallace Wallin.

Safety Engineering, New York.

XXXIII. March.

Sanitation in Great Industrial Plants.
Industrial Accident Prevention. L. A. Beagle.
Committee on Health and Safety.

April.

Explosives and Other Dangerous Articles in Transportation.
Hazards of Locomotive Engineers. F. S. Crum.
Amazing Story of Pittsburgh's Neglect. W. E. Mallalieu.
Siphons and Safety. R. L. Morrow.
About Boiler Safety. R. L. Hemingway.

Southern Medical Journal, Birmingham, Ala.

X. April.

Transmissibility of Pellagra. J. Goldberger.
The Pellagrous Intestine and Some of Its Parasites. K. M. Lynch.
Is the Average Physician Making Satisfactory Progress in the Early Diagnosis in Pulmonary Tuberculosis? J. H. Way.
Tuberculosis: A Disease of Children. F. C. Moor.
A Plea and a Plan for the Eradication of Malaria. F. L. Hoffman.
Infantile Paralysis. W. A. Evans.
The Wassermann Test in Public Health Work. F. A. Coward.
Ophthalmological Clinics. E. C. Ellett.
Tonsil and Adenoid Clinics. M. M. Cultom.
Hay Fever and Its Prevention in the Southern States. William Sheppegrell.

Survey, New York.

March 31.

A Canadian City in War Time: III, Way-Marks in Organized Giving. Paul U. Kellogg.
Nine Years of the Canadian Industrial Disputes Act. B. M. Selekman.

April 7.

A Canadian City in War Time: IV, Battle-Ground for Wounded Men. Paul U. Kellogg.
Rebuilt Men. Bruno Lasker.
Learning for Earning or for Life? W. D. Lane.

April 21.

Output and Hours. Henriette R. Walter.
Task of the Civilian War Relief.
A Canadian City in War Time: V, Recruiting and the Man-Poer Inventory. Paul U. Kellogg.
The New Public Health. III. Alice Hamilton and Gertrude Seymour.
Breweries vs. Bakeries. Eliz. Tilton.

April 28.

Medicine Mobilized. Gertrude Seymour.
Task of Civilian War Relief. II.
Reorganizing the State Board of Charities in New York. W. D. Lane.

Texas Medical Journal, Austin.

XXXII. April.

A Method of Controlling Preventable Diseases in Rural Districts. A. C. Ellis.

U. S. Public Health Reports, Washington, D. C.

32. March 30.

Court Decisions Pertaining to Public Health in 1916. Jason Waterman.

April 6.

Longevity.
Notification of Disease in Florida.

April 13.

Prevalence of Typhoid Fever in Cities during 1916.
Anopheline Mosquitoes. Their Distribution and Infection Under Field Conditions. M. B. Mitzmain.

April 20.

Poliomyelitis: Prevalence in Cities during 1916.
Detection of Hydrocyanic Acid Gas. Use of Small Animals for the Purpose. S. B. Grubbs.

BRITISH.

Journal of State Medicine, London.

XXV. March.

Prevention and Arrest of Venereal Disease in Women. Mary Scharlief.
Prevention and Arrest of Venereal Diseases in Man. C. J. Macalister.

Medical Officer, London.

XVII. March 10.

A Central Association for Instruction in Infant Hygiene and Feeding. G. T. Beatson.

March 17.

Emergency Vaccination Officers.
Sanitary Disposal of the Dead.
Alcohol as a Cause of Insanity.
Infant Welfare Work. R. Fraser.

March 24.

British Medical Association Memorandum on Venereal Diseases Schemes.
Ice Cream and Enteric Fever.
Use of Curative Sera.
Campaign against Venereal Diseases.

March 31.

Ophthalmia Neonatorum Nursing in London.
Some Demons of the Twentieth Century. J. Foster Palmer.

April 7.

Delayed Tuberculosis Infection.
Infant Welfare Conference at Glasgow. Continued.

BOOKS AND REPORTS RECEIVED.

The Nation's Health. By Sir Malcolm Morris, M. D., K. C. V. O. Funk & Wagnalls Company, New York. 1917. 150 pp. Price, $1.25 net.

Cancer: Its Cause and Treatment. B. L. Duncan Bulkley, A. M., M. D. Paul B. Hoeber, Publisher, New York. 1917. 12 mo. cloth, 250 pp. Price, $1.50 net.

The Internal Secretions. By Dr. E. Gley. Translated from the French and edited by Dr. M. Fishberg. Paul H. Hoeber, Publisher, New York. 1917. 12 mo. cloth, 240 pp. Price, $2.00 net.

Therapeutics and Preventive Medicine. Volume VIII of the Practical Medicine Series, 1916. Edited by George F. Butler, M. D., and W. A. Evans, M. D. The Year Book Publishers, Chicago. 380 pp. Price, $1.50 net. Price of series of ten volumes, $10.

Administration of Child Labor Laws. Part 2, Employment-Certificate System, New York. By Helen L. Sumner and Ethel E. Hanks. Publication No. 17 of the Children's Bureau of the U. S. Department of Labor.

Workmen's Compensation Laws of the United States and Foreign Countries. Bulletin of the United States Bureau of Labor Statistics, Whole No. 203. 1917.

Court Decisions on Workmen's Compensation Law, July 1, 1914–August 1, 1916. Prepared by the Bureau of Statistics and Information, of the Department of Labor of the State of New York. Special Bulletin No. 81, March, 1917.

Labor Injunctions in Massachusetts. Labor Bulletin No. 117, of the Bureau of Statistics of the Commonwealth of Massachusetts.

Seventh Biennial Report of the Bureau of Labor Statistics of the State of California. 1915–1916.

Transactions of the Chicago Society of Internal Medicine. February, 1917. Vols. I and II, Nos. 1 and 2.

Tuberculosis Families on Their Homes. A Study by the Association of Tuberculosis Clinics and the Committee on the Prevention of Tuberculosis of the Charity Organization Society of New York City.